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WAR DEPARTMENT, - - ADJUTANT GENERAL'S OFFICE.

No. XXI.

MILITARY NOTES

ON

CUBA.

NOVEMBER, 1898.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
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W 26.3:21

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WAR DEPARTMENT,
ADJUTANT GENERAL'S OFFICE.
Document No. 85.
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INTRODUCTORY NOTE.

These notes were first published in June, 1898. In this revised edition, much new matter has been added, and a table of contents and an index inserted. An examination of the table of contents will show the arrangement of the subject matter. Under the head of "Towns and Localities" are given the subdivisions of the provinces into judicial districts and townships, and then follows a description of the principal towns and cities. The description of a seaport is followed by the sailing directions for that port, thus giving everything available that is known of one locality in compact and complete form.

It is intended that this book should be used in connection with the large map of Cuba, published by the Adjutant General's Office, and the "Atlas of Cuba," now in preparation in the Adjutant General's Office. The book is so arranged, however, that the map and atlas are not necessary in order to follow the text.

The following works and reports have been consulted and extracts from them freely made. No special credit has been given in the text.

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Also, many original manuscript reports that have been received at this Office.

L. C. SCHERER,

Captain and Assistant Adjutant General.

WAR DEPARTMENT,

ADJUTANT GENERAL'S OFFICE,

WASHINGTON, Nov. 1898.

CUBA IN GENERAL.

(ix)

TABLE OF DISTANCES, IN MILES, BETWEEN TOWNS IN CUBA.

BAHIA HONDA.

838 BARACOA.

682 196 BAYAMO.

174 664 508 CARDENAS.

269 569 413 95 CIENFUEGOS.

742 147 60 498 473 COBRE.

201 617 481 45 68 541 COLON.

76 762 606 98 193 666 125 GUANABACOA.

105 730 577 69 164 637 96 29 GUINES.

73 765 609 101 196 669 128 3 32 HABANA.

683 162 48 442 417 102 485 610 581 543 HOLGUIN.

99 739 583 75 170 643 102 21 16 26 587 JARUCO.

700 168 18 456 431 42 499 624 595 557 55 601 JIGUANI.

709 244 37 465 440 97 508 633 604 566 85 610 55 MANZANILLO.

29 805 649 141 236 709 168 43 72 40 553 70 667 680 MARIEL.

137 631 475 37 132 535 64 61 32 64 479 38 493 502 104 MATANZAS.

480 358 202 306 211 262 279 404 375 407 206 381 220 229 447 343 NUEVITAS.

71 879 723 215 310 783 242 117 115 114 727 140 741 760 155 178 521 PINAR DEL RIO.

418 420 254 244 149 324 217 26 313 345 268 319 282 291 385 281 62 459 PUERTO PRINCEPE.

285 553 397 111 65 457 84 209 180 212 401 186 415 424 252 148 195 326 333 SAGUA LA GRANDE.

52 786 630 121 217 690 107 24 37 29 634 47 648 657 19 85 428 99 366 233 SAN ANTONIO DE LOS BANOS.

308 529 374 134 77 434 104 232 203 378 208 392 401 275 171 172 349 110 45 256 299 SAN CRISTOBAL.

108 730 574 66 161 661 93 32 12 35 578 12 592 601 76 29 372 149 310 147 56 99 200 SAN JUAN DE LOS REMEDIOS.

282 556 400 108 45 487 81 206 177 209 404 183 418 427 249 135 198 323 124 32 230 273 32 174 CATALINA.

84 754 598 90 185 685 117 5 24 11 692 20 616 625 61 51 396 125 334 201 31 76 224 24 199 SANTA MARIA DEL ROSARIO.

343 495 339 169 85 426 142 267 238 270 343 240 357 366 310 296 137 384 75 58 291 334 48 235 54 259 SANCTI SPIRITUS.

755 134 73 562 482 13 854 679 650 682 85 656 55 110 722 618 275 798 337 470 708 746 447 647 473 671 412 SANTIAGO DE CUBA.

75 765 609 127 209 670 125 16 32 13 613 37 627 623 27 77 394 114 345 212 11 51 235 22 196 20 257 695 SANTIAGO DE LAS VEGAS.

320 518 362 146 45 449 119 244 215 247 366 221 123 389 287 183 160 361 98 89 268 311 68 212 54 236 44 436 234 TRINIDAD.

638 200 44 464 484 104 437 562 533 565 48 539 62 71 605 431 158 794 220 353 686 629 330 530 356 554 295 117 552 318 TUNAS.

73 765 609 101 196 669 128 3 32 0 593 26 557 566 40 94 407 114 345 212 29 64 236 36 209 11 270 682 13 247 665 HABANA.

THE ISLAND OF CUBA.

HISTORICAL SKETCH.

The island of Cuba was discovered October 28, 1492, by Cristopher Columbus, who took possession of it in the name of Spain. The first attempt at a permanent settlement was made in 1511 by Don Diego Columbus, a son of Cristopher Columbus, and Diego Velasquez, who landed at Baracoa with 300 men. The first settlement, at Santiago de Cuba, was made in 1514, and the following year a settlement was made at Trinidad.

The island was first called Juana, then Fernandina, and later Ave Maria. It received its present name from the natives of the island, whom Columbus described as a peaceful, contented, and progressive race. Habana was founded on its present site in 1519. It was totally destroyed in 1538 by French privateers, but was immediately rebuilt. The capital of the island was located at Santiago de Cuba until 1550, when it was moved to the city of Habana. The first governor of the island was Fernando de Soto, afterwards famous as an explorer. In 1554 the city of Habana was again destroyed by the French.

The early settlers devoted themselves principally to raising cattle, but in 1580 the cultivation of tobacco and sugar cane was commenced, and this led to the introduction of negro slavery.

During the Seventeenth Century the island was kept in a state of perpetual fear of invasions by the French, Dutch, English, and the pirates who infested the seas.

In 1762 the English, under Lord Albemarle, attacked the city of Habana, and on August 14, after a siege of two months, the city and island capitulated. By the treaty of Paris, February, 1763, Cuba was returned to Spain.

In 1790 Las Casas was appointed captain general, and during his régime the island passed through an epoch of prosperity and advancement. He inaugurated a system of public improvements, built macadamized roads, laid out parks,

erected many public buildings, and constructed fortifications, many of which are standing to-day.

In 1796 the Count of Santa Clara succeeded Las Casas, and he also took a great interest in the welfare of Cuba.

A royal decree was issued in 1825 giving the captain general of Cuba absolute control, making him subject only to the reigning power of Spain. The consequence has been that since that time Cuba has been ruled by a succession of autocrats, sent from the Peninsula, with no interest whatever in the welfare of the island or its people, save to raise a revenue for the crown greater than that of his predecessor, pay the expenses of his régime, enrich his own purse, and then return to Spain to be the envy of the grandees.

During the latter part of the Eighteenth and the early part of the Nineteenth Century a number of insurrections and revolts were instituted, but were successfully put down by the Spaniards. The most important of these occurred in 1827-29, when Cuban refugees in Mexico and the United States planned an invasion of Cuba. They organized throughout Mexico, the United States, and Colombia branches of a secret society known as the "Black Eagle." On account of the anti-slavery sentiment, which was beginning to show itself in these countries, the scheme proved a failure.

A more serious insurrection occurred in 1844, when the slaves on the sugar plantations, especially in the Province of Matanzas, revolted. They were finally subdued, and over 1,300 persons convicted and punished.

President Polk made a proposition in 1848 for the purchase of the island by this Government for \$100,000,000, but the proposition was withdrawn on account of the anti-slavery sentiment of the North and West.

In 1854 preparation was made in Cuba and the United States for another attempt at insurrection, but before the plans of the revolutionists were fully matured the leaders were betrayed, arrested, and executed.

During the next fourteen years the island enjoyed a period of comparative quiet and prosperity.

In 1868 a revolution broke out in Spain, and in October the natives of Cuba took up arms and declared their independence. During this period many of the nations of the Western Hemisphere recognized the Cubans as belligerents. Spain did not succeed in putting down this rebellion until 1878.

About this time Spain was engaged in wars with Morocco, Chili, Mexico, Peru, and Cochin China, and for the purpose of keeping up these wars Cuba was called on to furnish the larger portion of the means. Revenues were raised, and the poor Cubans taxed to the utmost, each paying from three to six dollars per capita. At one time the Cuban debt reached nearly a billion and a quarter of dollars, and for the past twenty years the island has been paying an annual revenue to the Crown of from \$25,000,000 to \$40,000,000. It was during this war that the American ship *Virginius* was captured by the Spaniards, her cargo confiscated, and many of her passengers executed as revolutionists. This act nearly brought on a war between Spain and the United States.

In 1880 slavery was totally abolished in the island.

During the latter part of the year 1894 another revolution broke out on the island. At first the Spaniards considered it nothing more serious than a riot, but they soon found the revolution to be general throughout the island, and backed by the most influential of its citizens. It was a down-trodden people fighting for independence.

On February 15, 1898, the United States battleship *Maine* was blown up in the harbor of Habana.

So much sympathy had been shown by the citizens of this country for the Cubans and their cause that the Administration soon took a decisive step in the matter. By an Act of Congress, approved April 25, 1898, it was declared that war did exist, and had existed since April 21, 1898, between the United States and the Kingdom of Spain, whereupon, the President, in a proclamation dated April 26, 1898, declared and proclaimed the existence of war. After an unprecedented campaign by the United States, Spain asked for terms of peace, and on August 12 an agreement was signed by representatives of the two countries for a suspension of hostilities, and a committee appointed from each country to arrange the terms of peace.

SIZE AND SHAPE.

Cuba is larger than all the rest of the Antilles put together. Its length, following a curved line through its center, is 730 miles, and its average breadth is 80 miles. Its area is 43,319 square miles. It is irregular, shaped somewhat like a half moon, long and narrow, extending from east to west, its convex part facing the north. It has a coast line of about 2,200 miles, or, including all indentations, nearly 7,000 miles.

LOCATION.

It lies between 74° and 85° west longitude, and 19° and 23° north latitude. It is situated at the entrance to the Gulf of Mexico, and divides that entrance into two passages, that to the northwest being 130 English miles wide at the narrowest part, between the points of Ycacos, in Cuba, and Sable, on the Florida coast, and the southwest passage of nearly the same width, between the Cabo de San Antonio of Cuba, and the Cabo de Catoche, on the most salient extremity of the Peninsula of Yucatan. It is bounded on the north by the Florida, Ocampo, and Old Bahama channels; on the east by the Strait of Maisi; on the south by the Strait of Colon and the sea of the Antilles; and on the west by the Strait of Yucatan. The neighboring countries are: On the north, Florida, 100 miles distant; on the east, Haiti or San Domingo, 48 miles distant; on the south, Jamaica, 87 miles distant; and on the west, the Peninsula of Yucatan, 124 miles distant.

Cuba and her adjacent islands are of the utmost strategic importance. Situated as the islands are, where the Caribbean Sea and Gulf of Mexico join, they are the keys which control that vast body of water between the two Americas. And when the great canal of Nicaragua is completed, the occupancy and possession of Cuba will not only give us the control of the western Atlantic, but make us sovereigns over the eastern Pacific, as far as situation is concerned.

In case of war, during the invasion of our country by a foreign foe, our control of these islands would become almost a necessity for the protection of our southern coast.

The extent of the Cuban coast line, its numerous harbors, and the many directions from which it can be approached, are especially advantageous, for they convey power. They decrease the danger of a total blockade, to which all islands are subject, to a minimum.

Regarded as a naval base, Cuba renders itself self supporting by its own products, and by the accumulation of foreign imports. Its peculiar shape is such that supplies can be conveyed from one point to another according to the needs of the fleet, on short notice, and its many magnificent bays and harbors could be used as a refuge for vessels where they could make repairs, obtain supplies, and concentrate their forces, safe from the scrutinizing gaze of the enemy, and at the same time protect the American ports along the gulf. On account

of the close proximity of the island to the United States, its possession by a foreign power would be advantageous to its fleet in sustaining a blockade of our southern coast. On the other hand, our possession of the island would render such a blockade very difficult.

The island being situated midway between North and South America, and being within easy sailing distance of the most important Atlantic ports of both Europe and America, as shown by the table of distances given below, makes it a good rendezvous for the mobilization of our naval forces, should it ever become necessary to establish a patrol of the Atlantic.

TABLE OF DISTANCES FROM HABANA.

	Miles.
Key West	100
New Orleans	690
Mobile	640
Tampa	350
Savannah	613
Charleston	662
Philadelphia	1,137
New York	1,215
Boston	1,348
Quebec	2,421
Vera Cruz	809
Rio de Janeiro	3,536
Buenos Ayres	4,653
Montevideo	4,558
Port of Spain	1,521
Bermuda	1,150
Gibraltar	4,030
Plymouth (Eng.)	3,702

ADMINISTRATION (UNDER SPANISH RULE).

Cuba has enjoyed representation in the Spanish Cortes since the passage of the act of January 9, 1879. The Province of Habana sends three senators to Madrid, and each of the other five provinces two. The archbishopric of Santiago sends one, the University of Habana sends one, and the Society of the Friends of the Country one. Thirty deputies, allotted according to population, are sent to the House of Deputies. These are elected by popular ballot, in the ratio of one representative for every 50,000 inhabitants. It is said that out of 30 deputies elected in 1896, 26 were natives of Spain, and therefore the natives were in a hopeless minority, worse than the Irish members in the British Parliament.

The divisions of provinces and their parliamentary representation are regulated by the decree of June 9, 1878.

The military government has at its head a captain general (*ipso facto* governor general) with a Spanish army of 13,000 troops, paid out of the Cuban budget.

The captain general is appointed by the Crown, usually for three or five years, with rank of lieutenant general and full title of governor and captain general. He is the supreme head of the civil, ecclesiastical, military, and naval organizations in the island. He has a council of administration of 30 members, 15 appointed by the Crown and 15 elected by the provinces, according to population. These elections, however, are so controlled as to give the Spanish Government a safe majority of 25 to 5. To make this majority still more safe, the governor general may suspend from 1 to 14 at will, or all upon consulting a peculiar body called the "Council of Authorities." The members of this council serve without pay. Its duties are to prepare the budget and pass resolutions (quasi acts) on all necessary public matters. If the governor general likes these resolutions, he gives effect to them.

The council of authorities is composed of the archbishop of Santiago (when present), the bishop of Habana, the commanding officers of the army and navy, the chief justice of the supreme court of Habana, the attorney general, the head of the department of finance, and the director of the local administration. The heads of executive departments are not members of this council, but the heads of departments are. They do not hold regular sessions, but are called together as occasion may require, but their conclusions have no binding effect.

The administration in each province is conducted by a governor, appointed by the Crown, who is an officer of the army of the rank of major general or brigadier general, and is directly responsible to the governor general. There is also in each province an elective assembly of not less than 12 nor more than 20 members, according to population. They are elected for four years, and one-half the number are replaced every second year. The elections are held in the first half of September, and sessions twice a year. On meeting, the first business is to ballot for three candidates, from which list the captain general appoints one as speaker. He may, however,

disregard the names presented and appoint any other member. Moreover, the governor of the province may, at his pleasure, preside and vote; and if, in his judgment, the public interest demands it, he may prorogue the assembly and report his action to the governor general. The latter has the authority to suspend any of the provincial assemblies and report the fact to the Government at Madrid.

The provincial governor nominates five members of the assembly, to be appointed by the governor general as a local council or cabinet. As, however, the powers and duties of the provincial governments are only equal to those of county boards in the United States, it is easily seen that the home rule accorded to Cuba has its limits.

City governments are formed on the same general plan as the provincial. The board of aldermen may consist of any number, from 5 to 30 inclusive, according to population. They elect one of their number as mayor; but the governor general may substitute any other member.

The judicial system of Cuba includes two superior courts (*audiencias*), one sitting at Puerto Principe, for the two eastern provinces, and the other at Habana for the four western provinces. Inferior to these is a network of judicial districts and local magistracies. The judicial system is less important, because under the decree of June 9, 1878, the governor general has authority to overrule any decision of any court, and even to suspend any law or order emanating from the Government at Madrid.

OROGRAPHY.

Cuba is generally low and swampy along its coast. Especially is this true of the southern coast, while the interior of the island is high table-land.

There are many mountain ranges in the interior, some reaching an elevation of over 6,000 feet above sea level. There are also a few ranges close to the coast in the provinces of Santiago de Cuba and Pinar del Rio. While the mountain ranges as a rule run east and west, there are numerous short spurs at either extremity of the island which take a northeasterly and southwesterly direction, and a few run north and south. There are no known volcanoes in Cuba or in the Isle of Pines.

The various ranges will be described under the provinces in which they are located.

HYDROGRAPHY.

On account of the peculiar shape of the island, being long and narrow, with its highlands in the interior, nearly all of the rivers flow to the north or south, and are therefore necessarily short. The majority of them are mere streams and creeks, rising in the mountains of the interior, and emptying into the sea on the north or south coast. There are few navigable rivers, and these for but a short distance from their mouths, and only for small coasters and canoes. The longest and most important river of Cuba is the Cauto, in the Province of Santiago de Cuba.

In the interior there are many pretty lakes and bayous, and while some of them are very picturesque, like the rivers, they are of little importance commercially. Many of these lakes and bayous are salt water bodies.

CLIMATE.

Situated within and near the border of the northern tropical zone, the climate of the low coast lands of Cuba is that of the torrid zone, but the higher interior of the island enjoys a more temperate atmosphere. As in other lands on the border of the tropics, the year is divided between a hot, wet season, corresponding to the northern declination of the sun, and a cool, dry period. From May to October is called the wet season, though rain falls in every month of the year. With May spring begins, rain and thunder are of almost daily occurrence, and the temperature rises high, with little variation. The period from November to April is called the dry season. For seven years the mean annual rainfall at Habana in the wet season has been observed to be 27.8 inches, and of the dry months 12.7, or 40.4 inches for the year. The eastern part of the island receives more rain than the western. There are seldom over twenty rainy days in any one month, the average being from eight to ten. The rainfall is generally in the afternoon, and on an average there are only seventeen days in the year in which it rains in both forenoon and afternoon. At Habana, in the warmest months, those of July and August, the average temperature is 82° F., the maximum being 88°, and the minimum 76°; in the cooler months, December and January, the thermometer averages 72°, the maximum being 78°, and the minimum 58°. The average temperature

of the year at Habana, on a mean of seven years, is 77°; but in the interior, at elevations of over 300 feet above the sea, the thermometer occasionally falls to the freezing point in winter. Hoar frost is not uncommon, and during north winds thin ice may form, though snow is unknown in any part of the island. It hails frequently. The prevailing wind is the easterly trade breeze, but from November to February cool north winds, rarely lasting more than forty-eight hours, are experienced in the western portion of the island, by which is added a third seasonal change. From 10 to 12 o'clock are the hottest hours of the day; after noon a refreshing breeze sets in from the sea. Hurricanes may occur from August to October, but sometimes five or six years pass without such a storm.

The following table shows the meteorological conditions at Habana:

Months.	Tem- pera- ture.	Humid- ity.	Rainy days.	Rainfall.	Condition of sky.	
					Cloudy days.	Clear days.
	° F.	Per cent.		Inches.		
January	71	82	8	2.5	5	26
February	74	84	7	2.1	8	20
March	74	82.8	6	2.4	7	24
April	76	82.4	4	1.2	5	25
May	78	85.4	8	3.6	8	23
June	81	85	10	5.1	6	24
July	82	87.6	12	5.6	6	25
August	82	88.2	12	4.8	6	25
September	80	88.2	14	6	7	23
October	79	85.2	9	3.2	7	24
November	75	86.2	8	3.3	8	22
December	73	84.8	6	1.2	7	24
Means or totals.....	77	85.15	104	41.0	80	285

DISEASES AND HYGIENIC MEASURES.

The worst place for foreigners on their arrival in Cuba is the coast, and the important cities are generally located along the worst part of the coast. It is better to arrive in a cool season, and even then the heat will necessitate the changing of all woolen garments for those of linen or cotton. The sickly or indolent appearance of the whites of the country is

soon acquired, activity and spirits diminish, the body becomes heavy, and the skin becomes covered with abundant perspiration, due to anæmia, all of which shows that the person is becoming acclimated. This period will not usually exceed a year, during which time one should guard against any excess of work or pleasure, late evenings, bodily or mental fatigue, exposure to the sun, or rapid cooling off, or any cause that might produce illness. Exposure to the sun in an unhealthy country may bring on fever, which generally assumes the character of yellow fever; sudden cooling off is also the cause of many diseases. When the skin is covered with perspiration, it should not be exposed to a draft of cold air, nor should clothes saturated with water or perspiration be left on, but should be changed, if possible, the body being first wiped dry and rubbed with cane brandy or rum.

Exercise on foot, horseback, or in a carriage is necessary for one who is visiting this land for the first time, but only in the morning and evening; washing and bathing are also very good, first in tempered and after a few days in cold water; baths should not be taken after hard work, and the best time is the morning or at noon, after the body has been at rest.

While ready perspiration is one of the essentials to the preservation of health, danger also lurks in it, for when in such a condition, a few moments in the shade, exposed to a breeze, will bring on a cold more quickly here than in any other place outside the tropics. If it is noticed that the perspiration is stopping on a warm day, a physician should be consulted immediately, and also in the case of giddiness, headache, etc.

Cotton garments are much better than those of linen, for they absorb less perspiration and render the skin less susceptible to chills. The soldiers of the French and English armies in the Antilles use flannel waistcoats to guard the body as much as possible, and prevent evaporation, by keeping it always at an even temperature; this article of clothing is very suitable for those who are predisposed to chest ailments.

The best field outfit is a light-weight poncho of such proportions that it can be used for an external blanket, or when spread over a hammock, forms a protection from dew at night. This hammock cover should be a very light blanket, preferably of some other material than woolen, in order to discourage vermin.

As to food, the visitor should neither imitate the sober habits of the Creole, nor continue the diet observed at home, but he should adopt a medium, and use wholesome and nutritious meats, and the salt and fresh water fish that abound in these regions. He should not disdain the vegetables and plants which the Creoles do not like. It is also well to use certain condiments, such as pepper, cloves, alspice, cinnamon, and others that heighten and flavor food and aid digestion; though used, they should not be abused. The moderate use of certain tropical fruits to which northerners are accustomed, such as oranges, lemons, limes, and pine-apples, is advantageous without question, but there are hosts of others, mostly of a soft, squashy nature, and a sweet sickish taste, such as the mango, sapote, alligator pear, etc., that it is wise to avoid. The combination of alcohol with them is almost deadly, and here, on its native heath, it is well to let the banana alone.

Persons from the north are always anxious to taste Cassava bread. It is wise, therefore, to warn those not fully acquainted with the poisonous character of the root from which it is made not to try experiments in this direction, unless satisfied that the product is made by some loyal Cuban who is familiar with the substance that is being dealt with.

Excess in eating and drinking should be avoided, as it produces intestinal disorders which result in grave diseases. The slow and continuous use of alcohol causes a marked deterioration in the constitution, being one of the greatest obstacles to acclimatization; it diminishes the appetite and retards acclimatization. However, a little rum mixed with water is a stimulating and wholesome drink, especially on hot days. Soft drinks and lemonade are not good, as they cause a kind of plethora which turns into diarrhœa. Fruits produce the same effect, and it is necessary to be careful of the least indisposition which tends toward diarrhœa.

In Cuba the slightest wounds on the legs or feet quickly ulcerate. A scratch, which might be cured by two or three days' rest, turns into an ulcer from continual marching and friction, and a soldier is soon unfitted for service.

The following suggestions regarding health will be found useful:

Never start out early in the morning without having taken at least a cup of coffee, but do not eat heartily at that time.

Breakfast should be taken before the troops are called upon for marching, work, or exercise of any kind. Meals should be taken at regular hours, and should be warm. No raw food of any kind should ever be eaten. Hot coffee and a biscuit should be eaten by each man before going on guard at night.

Only boiled water should be used for drinking; if one must march during the day, he should fill his canteen with coffee or tea before starting out; this will insure the water having been boiled. No intoxicating liquor of any kind should be drunk. Drink cocoanut milk in preference to anything else.

Do the hardest work of the day between 6 and 11 in the morning, then eat breakfast, take a siesta, and remain quiet until 3 p. m. Avoid the midday sun as much as possible, but if exposed to it, be careful in cooling off. All marching should, if possible, be avoided during the heat of the day.

Dress lightly, avoiding woolen, medical statements to the contrary notwithstanding. Protect the legs, preferably with canvas leggings.

Always examine your bed and blankets before retiring. If possible, bedding should be aired daily.

Always have quinine and antiseptics with you. The former should be taken every morning before breakfast.

Men should not be allowed to sleep on the ground, if it can possibly be avoided; a hammock should be used, on which a poncho should be placed beneath the other bedding.

If occupying a house, the windows and doors should be closed at dusk.

Avoid getting wet, and change wet clothes as soon as possible; never put on damp clothing. Alternate with two suits of underclothing, allowing the undersuit worn one day to hang and dry during the next.

Straw hats should be worn during the day, but at night the men should wear some sort of cap which they can keep on their heads while sleeping.

When in camp all refuse from the kitchen should be burned; latrines should be inspected daily, and disinfected as far as possible.

The gravest as well as the most common of the diseases in Cuba are the following:

Yellow fever, diarrhoea, dysentery, and paludism (swamp or malarial fever), to which must be added liver complaints, which often accompany them, and diseases produced by certain insects and worms. Traumatic and infantile tetanus,

convulsions, intermittent fevers, smallpox, and phthisis are frequent, as well as cardiac affections. Cases of pneumonia, strangles, and hydrophobia are rare.

Every foreigner, upon arriving in Cuba, should observe a severe régime in his manner of living until he has become acclimated. He must impoverish his blood to an extent which in other climates might cripple his health, but rich blood, so enviable in northern countries, is injurious in Cuba. He will inevitably have to suffer the "vomito" or acclimating fever; in order to prevent this from turning into yellow fever (vomito negro), he must purge himself thoroughly upon his arrival, preferring for the purpose acid purgatives. He must drink no coffee or alcoholic drinks. At his meals, which ought to be as plain as possible, he should drink water mixed with a little wine. Orangeade or lemonade are very good if taken before breakfast or between meals, but they are very injurious if taken during the process of digestion. He should bathe frequently in lukewarm water; cold water may be more agreeable, but it is very injurious.

Fear and apprehension are fatal to this disease. One should remember that, if hygiene be observed, "the vomito" is not always dangerous, and that many have passed through it without realizing serious effects.

The symptoms of this disease are always alike. The first day there is a great headache and sometimes dizziness. On the second day all the bones of the body ache as in the grip, and when the pain fixes itself in the hips and about the waist the pulse becomes altered. Upon feeling the first headache, one should refrain from eating. If it is three hours since the last meal, there should be taken immediately, even before the doctor's arrival, a strong purgative of oil, although a purgative of lemonade or citrate of magnesia may have been taken the day before. One or the other of the above remedies should be taken once a week after arriving in Cuba. The day on which the weekly purgative is taken a strict diet should be observed. Until acclimated it is well not to dance or become overheated in any way.

It may be stated of yellow fever, that if properly treated, less than 8 per cent of the patients die. The remedies ordinarily used are citrate of magnesia or castor oil and lime juice. In general, the yellow fever epidemic appears every ten years. It is well, if possible, to leave the coast regions

and go to the mountainous ones, as the fever seldom goes beyond certain altitudes.

Tetanus, or lock jaw, is the most fatal of the diseases which attack unacclimated persons, especially those whose work involves much exposure to the weather. Injuries to the feet are exceedingly prone to result in tetanus. Any injury to the foot should be very carefully looked after, and open sores should be guarded from the wet.

Intermittent fever is usually contracted in the swampy districts. There is little use in keeping the patient on the island after the fever has been contracted; he should be gotten away as soon as possible. This is also true of all the forms of malaria.

Leprosy is a disease that prevails to a considerable extent, and it is said there are more lepers in Cuba than in the Sandwich Islands. In the opinion of a physician from Toledo, Ohio, no white man is liable to its attacks, though he advised avoiding too close contact with those afflicted, especially with the Chinese, who frequently have it, but who conceal the fact as long as possible. That form of it known as elephantiasis, producing abnormal swelling of the lower extremities, is frequently seen in the streets of Habana, and is in no sense considered contagious.

While much that has been written concerning Cuba would seem to indicate that it is a veritable pest hole, such descriptions actually cover only the worst conditions, and comparatively a small portion of the island, for probably at least two-thirds of it is as healthy, even in the summer, as any country in the world.

Cases of longevity are not wanting; there are numerous instances where natives have attained 100 years, some 130 years, and there is even one known to have lived to the age of 150. Longevity is most frequent among the colored population.

The sickly season, according to the latest edition of "The Navigation of the Caribbean Sea and Gulf of Mexico," is as follows:

THE NORTH COAST.

Fevers, more or less malignant, prevail from May to November.

BARACOA.—Remittent fever is at times prevalent at Baracoa, but the place is generally healthy, owing to the exposed position

NUEVITAS DEL PRINCIPE.—The health of the city is good, the sickly season being from April to September.

HABANA.—Yellow fever is endemic. The sickly season is from June to October. As there is little ebb and flow of the tide in the harbor, the water is filthy and foul smelling. The water should not be used for washing decks or clothing.

BAHIA HONDA.—The health of the place is good, except in the sickly season, which commences in April and lasts through the summer.

PORT MARIEL.—It is generally healthy, the sickly season being from April to September.

THE SOUTH COAST.

SANTIAGO DE CUBA.—The place is healthy, but in summer yellow fever occurs. The mornings and afternoons are pleasant. Liberty to go ashore should not be given here.

CIENFUEGOS.—The sanitary condition is good, the city being clean.

PREVALENCE OF YELLOW FEVER AT PORTS OF ENTRY.

1. **HABANA.**—Annual prevalence since 1761, the chief center of infection, and most dangerous to shipping.

2. **MATANZAS.**—Annual prevalence since 1828, and probably much longer; an important center of infection, but less dangerous to shipping than Habana.

3. **CARDENAS.**—Annual prevalence certainly since 1836, and it was not founded until 1828. It is an important center of infection, but not specially dangerous to shipping, because of the distance at which vessels anchor from shore.

4. **CIENFUEGOS.**—Annual prevalence since at least 1839, and it was not founded until 1819–1825. It is a dangerous center of infection, but like Matanzas, has a very large harbor, and is less dangerous than Habana to shipping.

5. **SAGUA.**—Some cases of yellow fever occur annually, but vessels are very rarely infected, as these anchor several miles distant from the coast, and Sagua is ten miles inland.

6. **BARACOA.**—Yellow fever occurs occasionally, but not annually as an epidemic.

7. **CAIBARIEN.**—Cases of yellow fever occur frequently, but not every year. Very little danger to vessels, as these anchor many miles distant.

8. **TRINIDAD.**—Annual prevalence certainly since 1838, and probably longer. The harbor is not believed to be specially dangerous to vessels.

9. **SANTIAGO DE CUBA.**—Annual prevalence certainly since 1851, and probably very much longer. It is a noted center of infection, and its small harbor is more dangerous to the shipping than any other port in the whole island.

10. **MANZANILLO.**—Annual prevalence. It is in constant communication with Santiago de Cuba, Trinidad, and Cienfuegos. As vessels anchor in the open sea several miles from shore, they probably suffer little.

11. **LAS NUEVITAS DEL PRINCIPE.**—Annual prevalence. Vessels anchor a mile or more distant, and are in but little danger.

12. **GUANTANAMO.**—Annual prevalence. The town is about seven miles from the harbor, and vessels are probably little exposed to infection.

13. **GIBARA.**—Cases of yellow fever do not occur every year. Vessels anchor distant from the shore, and are in little danger.

14. **ZAZA.**—Cases of yellow fever do not occur every year. Vessels are probably in very little danger.

15. **SANTA CRUZ.**—Cases of yellow fever occur in the majority of years. Vessels anchor far from shore, and are in little danger.

SEAPORTS WHICH ARE NOT PORTS OF ENTRY.

16. **BAHIA HONDA.**—Yellow fever is not endemic; it is even said to be "unknown," and to present no cases "either indigenous or imported."

17. **BATABANO.**—Very few cases occur.

18. **CABANOS.**—Cases occur very rarely, and the disease is not endemic.

19. **ISLA DE PINOS.**—Cases occur very seldom, and it is as remarkably free as Bahia Honda from the disease.

20. **MARIEL.**—Yellow fever is not endemic here.

21. **PUERTO PADRE.**—The disease is not endemic.

INLAND TOWNS.

22. **BAYAMO.**—Occasionally epidemic, but not annually endemic.

23. **BEJUCAL.**—Suffers little from yellow fever.

24. **CIEGO DE AVILA.**—Not endemic.

25. **COBRE.**—Yellow fever is not endemic.

26. **COLON.**—Yellow fever is not endemic.

27. GUANABACOA.—Cases occur annually.
28. GUANAJAY.—Cases occur in the majority of years.
29. GUINES.—Yellow fever is not endemic.
30. HOLGUIN.—Several epidemics since 1851, but cases do not occur every year.
31. JUCARO.—Endemic.
32. MARIANAO.—Endemic.
33. MAYARI.—Not endemic.
34. PALMA SORIANO.—Not endemic.
35. PINAR DEL RIO.—Not endemic.
36. PUERTO PRINCIPE.—Endemic.
37. REMEDIOS.—Endemic.
38. SAN ANTONIO.—Endemic.
39. SANCTI SPIRITUS.—Endemic.
40. SAN JOSE DE LAS LAJAS.—Endemic.
41. SANTA CLARA.—Cases occur in the majority of years.
42. SANTIAGO.—Endemic.
43. VICTORIA DE LAS TUNAS.—Cases occur in the majority of years.

The above forty-three places are all those from which trustworthy information was secured, and it appears that of twenty-one seaports, yellow fever occurs annually in ten of them, and does not occur annually in the remaining eleven; while in the twenty-two inland towns, its prevalence varies in proportion to the extent of their commerce with permanently infected centers, and with the number of immigrants; so that the above list tends very strongly to prove that seaports in Cuba are no more liable to yellow fever, solely because located on the sea, than are inland towns. Yet the contrary has long been taught.

The Isle of Pines, Bahia Honda, Cabanas, Mariel, Zaza, and other preeminently maritime places in Cuba suffer little, if at all, with yellow fever.

INSECTS.

Among the poisonous insects are centipedes, tarantulas, scorpions, mosquitoes, and sand flies.

Of flies alone over 300 species are known. The one most to be dreaded is called rodador (the roller), thought by the people to be a mosquito, which fills itself with blood like a leech and when satiated drops off and rolls away. Still worse is the jejen (another supposed mosquito), so small as not to be

visible to the naked eye, but its sting is felt. Neither nets, smoke, nor any other defenses are of any avail against it. The only recourse is flight.

An annoying and dangerous pest is found in the chigoe or jigger, a small insect closely resembling the common flea. The female burrows under the skin of the foot or under the finger or toe nails, and soon acquires the size of a pea, its body being distended with eggs. If these eggs be allowed to hatch underneath the skin, irritating and dangerous sores result. The insect must be extracted entire and with great care as soon as its presence is discovered. Similar precautions must be taken in regard to common ticks, which abound especially in fields where hogs have been allowed to run at large. The wound made by extracting a chigoe or a tick should be carefully washed, coal oil applied, and outside moisture excluded for at least 48 hours.

ANIMAL LIFE.

The only peculiar animal in the island is the jutia, shaped like a rat and from 12 to 18 inches long, exclusive of the tail. A few deer are found about the swamps, but they are supposed to have been introduced from Europe. The woods abound in wild dogs and cats, sprung from those animals in a domestic state and differing from them only in form and size. Of domestic animals, the ox, the horse, and the hog are the most valuable, and form a large proportion of the wealth of the island; sheep, goats, and mules are less numerous. There are some 4,000,000 head of the domestic animals just mentioned. The manati (sea-cow) frequents the shore. The domestic fowls include geese, turkeys, peacocks, and pigeons. There are over 200 species of indigenous birds, and more than 700 kinds of fish in the rivers, bays, and inlets. Numerous insects and nonvenomous reptiles inhabit the woods and mountains. Oysters and other shellfish are numerous, but of inferior quality. Turtles abound, and the cayman (crocodile) and iguana (a kind of lizard) are common. Snakes are not numerous. The maja, 12 or 14 feet in length and 18 or 20 inches in circumference, is the largest, but is harmless; the juba, which is about 6 feet long, is venomous.

The domestic animals let loose in the island from the earliest period of its occupation have found a place favorable for their reproduction; but, while increasing, they have also undergone certain modifications. Cuban horses of the Andalusian race

have lost in stature and breadth of chest, but they have gained in sobriety, endurance, and vitality. Before the great insurrection of 1868 they were so numerous throughout the island, and especially in the central and western regions, that nobody traveled afoot. To-day the number of saddle animals has greatly diminished in proportion to the inhabitants, and nowhere are wild horses found, as they formerly were in Romano Cay, in the Nipe savannas, and other isolated regions. Asses are not numerous, being kept mainly for breeding purposes. Mules are used for transportation in the mountainous regions. The camel of the Canaries, which was introduced at one time, did not succeed, owing to the niguas, a species of insect which wounded its feet. In certain parts of the island, especially in the district of Baracoa, the ox is used both as a beast of burden and in driving. Goats and sheep have not thrived so well in Cuba as hogs and cattle; the goat has lost its vivacity, while the sheep, being poorly cared for, has replaced its fleece by a coat of hair.

GEOLOGY.

The larger portion of the following description is taken from Humboldt's Narrative, Vol. VII. Although the work is old, yet it is still the best authority on the above subjects obtainable:

The island of Cuba, for more than four-fifths of its extent, is composed of low lands. The soil is covered with secondary and tertiary formations, formed by rocks of gneiss, granite, syenite, and euphotide. The island is crossed from east-southeast to west-northwest by a chain of hills, which approach the southern coast between the meridians of the cities of Puerto Principe and Villa Clara; while more to the west, near Alvarez and Matanzas, they stretch toward the northern coast, going from the mouth of the Rio Grande to Villa de la Trinidad. The hills of San Juan on the northwest form needles or horns more than 900 feet high, from which declivities go regularly toward the south. This calcareous group has a majestic aspect, seen from the anchorage near Cayo de Piedras. Sagua and Batabano are low coasts, and west of the meridian of Matanzas there is no hill more than 1,200 feet high, with the exception of Pan de Guaixabon. The land of the interior is generally undulating, and rises from 250 to 325 feet above sea-level.

The decreasing level of the limestone formations of the island of Cuba toward the north and west indicates a submarine connection of those rocks with the lands equally low of the Bahama Islands of Florida and of Yucatan.

It is probable that the alluvial deposits of auriferous sand, which were explored with so much ardor at the beginning of the Spanish conquest, came from the granite formations in the western part of the island. Traces of the sand are still to be found in the Holguin and Escambray rivers.

The central and western portions of the island contain two formations of compact limestone, one of clayey sandstone, and another of gypsum. The former is white, or of a clear ochre yellow, with dull fractures, sometimes conchoidal, and sometimes smooth, and furnishes petrifications of pecten cardites, terebellidæ and madrepores. No oolitic beds are found, but porous beds almost bulbous are seen near Batabano. Yellowish, cavernous strata, with cavities from 3 to 4 inches in diameter, alternate with strata altogether compact and poorer in petrifications.

The chain of hills that borders the plain of Güines towards the north, belongs to the latter variety, which is reddish-white and almost lithographic. The compact and cavernous beds contain pockets of brown ochraceous iron. Perhaps the red earth so much sought after by the planters of coffee is produced by the decomposition of some superficial beds of oxidized iron mixed with silica and clay, or perhaps by reddish sandstone superposed on limestone. The whole of this formation might be designated as the limestone of Guines, to distinguish it from another much more recent. It forms, in the hills of San Juan, steep declivities, resembling the mountains of limestone of Coripe in the vicinity of Cumana. They contain great caverns, the most prominent being near Matanzas and Jaruco. There are numerous caverns, and where the pluvial waters accumulate and disappear in small rivers, they sometimes cause a sinking of the earth.

To the secondary soil belongs the gypsum of the island. It is worked in several places. We must not confound this limestone of Güines, sometimes porous, sometimes compact, with another formation so recent that it seems to have augmented in our days, i. e., the calcareous agglomerates, on the islands that border the coast between Batabano and the Bay of Xagua.

At the foot of Castillo de la Punta are shelves of cavernous rocks, which are covered with verdant alvæ and living poly-piers. Enormous masses of madrepores and other lithophyte corals are set in the texture of those shelves. This would lead one to the conclusion that the whole of this limestone rock, which constitutes the greater part of the island, is due to the uninterrupted action of productive organic forces, an action which is still in operation in the depths of the ocean; but these limestone formations soon vanish when the shore is quitted, and series of coral rocks are seen, containing formations of different ages—the muschelkalk, the Jura limestone, and the coarse limestone. The same coral rocks as those of Castillo and La Punta are found in the lofty inland mountains, accompanied by petrifications of bivalve shells, very different from those which are actually seen on the coasts of the Antilles. There is no doubt as to the relative antiquity of that rock, with respect to the calcareous agglomerates of the Cayos. The globe has undergone great revolutions between the periods when those two soils were formed, one containing the great caverns, the other daily augmenting by the agglomeration of fragments of coral and quartzous sand.

On the south of the island of Cuba the latter of these soils seems to be superposed, sometimes on the Jura limestone of Güines, and sometimes immediately on the primitive rocks.

The secondary formations on the east of Habana are pierced in a singular manner by syenitic and euphotide rocks, united in groups. The southern bottom of the bay, as well as the mouth, are of Jura limestone, but on the eastern bank of the Ensenadas de Regla and Guanabacoa the whole is transition soil. In going from north to south we find syenite, composed of a great quantity of amphibole, partly decomposed, a little quartz, and a reddish-white feldspar, seldom crystallized. Farther south, toward the small bays of Regla and Guanabacoa, the syenite disappears, and the whole soil is covered with serpentine, rising in hills from 190 to 255 feet high, and running from east to west.

This rock is much fissured, externally of a bluish brown, covered with detritus of manganese, and internally of a leek and asparagus green, crossed by small veins of asbestos. It contains neither granite nor hornblende, but metalloide diallage is disseminated throughout the mass. Many of the pieces of serpentine have magnetic poles. In approaching Guana-

bacoa, the serpentine is crossed by veins from 12 to 14 inches thick, filled with fibrous quartz, amethyst, fine mammelones, and stalactiform chalcedonies.

Some copper pyrites appear among these veins, accompanied, it is said, by silvery gray copper. In some place spetroleum runs out from rents in the serpentine. Springs of water are frequent, containing sulphureted hydrogen, and a deposit of oxide of iron.

Volcanic rock of a more recent period, as trachyte, dolerite, and basalt, has not been discovered on the island.

MINERALS.

The island of Cuba has a great variety of minerals, gold, silver, iron, copper, lead, asphaltum, antimony, platinum, petroleum, marble, jasper, etc., being found in a greater or less quantity. As yet, no coal has been found, although a substance resembling it is much used as fuel, and generally called coal by the natives. Gold and silver have not been found in paying quantities, although the early settlers mined a considerable amount of each.

LEAD.—So little seems to be produced that it is unnecessary to consider the output.

IRON.—Large deposits are found in the province of Santiago de Cuba and Pinar del Río. Its output to the United States is very large.

COPPER.—Large deposits are found in Santiago de Cuba, but have not been much mined, on account of the revolution and heavy taxes.

ASPHALTUM.—Deposits of asphaltum are of frequent occurrence in various parts of the island, and have been mined and exported to some extent.

ANTIMONY.—Antimony, with lead, is said to exist near Holguin.

PETROLEUM.—Crude oil is found, but the mineral oil in use comes from the United States in the crude state. There are several refineries near Habana.

SULPHUR.—Deposits of pure sulphur probably do not exist, but the presence of sulphur is shown in the various mineral springs.

SALT.—Salt is deposited in great quantities in various parts of the island.

QUICKSILVER.—It is said that in former times some quicksilver was found near Remedios.

CLAYS.—Valuable deposits of clays are found, especially in the Isle of Pines.

LIME.—Most of the soft limestones make excellent lime, and about Habana are many limestone quarries and amongst them kilns for burning.

BUILDING STONE.—A soft carbonate of calcium is very common, and is much used for building material on the island.

OCHRE.—Some ochre is found in Mazanillo, Santiago de Cuba, Santa Maria del Rosario, and Guanabacoa.

CHROME.—Deposits of this pigment have been worked near Holguin.

CHALK.—Chalk is found near Manzanillo and Moron.

MARBLE.—This is found in great abundance in many places.

LOADSTONE.—Large quantities of loadstone also exist.

MOLDING SAND.—Near Nueva Filipina a fine quality of molding sand is found.

TALC.—Talc is also found in the island.

FORESTRY.

It is estimated that there are about 20,000,000 acres of wild and uncultivated land in the island of Cuba, 12,000,000 acres of which are virgin forest. These forests are to a great extent dense and almost impenetrable in some sections, especially the eastern portion of Santa Clara Provincé, Puerto Príncipe, and some parts of Santiago de Cuba. The Isle of Pines is also heavily wooded. The forests preserve their verdure throughout all seasons of the year.

The palm is the most common of all the Cuban trees, and perhaps the most valuable. There are a great many varieties. Of these, the Palma Real (Royal Palm) is the most common, and, like the maguey of Mexico, is the mainstay of the natives. The other woods of importance are the mahogany; ebony; cedar; acana, a tree with a hard reddish wood; ginebrahacha, a kind of fir; guayacan; jigui; maranon, a tree which yields a gum resembling gum arabic; oak; pino de tea, a torch pine; evergreen oak; sabicu; ocuje, a wood much used for construction purposes; sabina; nogal; walnut; majagua, a tree from which very durable cordage is made; Brazilian wood; capeche wood; fustic; cocoa; banana, and the magnificent cieba.

SOILS.

The lands most celebrated for their fertility are the districts of Sagua, Cienfuegos, Trinidad, Matanzas, and Mariel. The Valley of Guines owes its reputation to artificial irrigation. Notwithstanding the want of great rivers, and the unequal fertility of the soil, the island of Cuba, due to its undulating surface, its continually renewing verdure, and the distribution of its vegetable forms, presents at every step the most varied and beautiful landscape.

The agriculturists of the island distinguish two kinds of earth, often mixed together like the squares of a draft board, black earth, clayey and full of moisture, and red earth, more silicious and mixed with oxide of iron.

The black earth is generally preferred for the cultivation of the sugar cane, because it conserves humidity better, and the red earth for coffee; nevertheless, many sugar plantations are established in red soil.

The section around Habana is not the most fertile; and the few sugar plantations that existed in the vicinity of the capital are now replaced by cattle farms and fields of maize and forage, on which the profits are considerable, on account of the demand from the city.

AGRICULTURAL PRODUCTS.

The principal agricultural products of Cuba are sugar cane, coffee, tobacco, cocoa, cotton, sarsaparilla, vanilla, copal, China root, Cassia, Palma Christi, mustard, pepper, ginger, licorice, balsam de Guatemala, India rubber, etc. The three most important are sugar, tobacco, and coffee.

FRUITS.

The fruits of Cuba are numerous and delicious. Among them are the pineapple, custard apple, cocoanut, plum, guava, banana, orange (the Cuban orange is not particularly fine), citron, lemon, mango, etc.

POPULATION.

While the area of Cuba and its dependent islands is nearly as great as that of the State of Pennsylvania,* it has less than

* Area of Pennsylvania, 45,215 square miles; estimated population 1894, 5,550,550. Area of Cuba, 43,124 square miles; estimated population in 1894, 1,723,000.

one-third as many inhabitants. Yet, when it is borne in mind that the desert sand-keys that skirt the island, the impassable swamps that line its south coast, and the rugged and unexplored uplands of its eastern extremity, altogether occupy fully one-fifth of its area, it is seen that Cuba is fairly well inhabited. Estimating its habitable area at 32,500 square miles, it is seen to be twice as densely populated as the State of Missouri,* or in about the same ratio as Virginia.†

Of the aboriginal inhabitants of Cuba, none survived to see the Seventeenth Century. The present population may be divided into five classes:

1. Natives of Spain—"Peninsulars."
2. Cubans of Spanish descent—"Insulars."
3. Other white persons.
4. Persons wholly, or in part, of the African race.
5. Eastern Asiatics.

By reckoning the first three classes together and excluding the fifth entirely the usual division of whites and negroes is obtained. It has been customary to reckon among negroes persons having one-fourth, one-half, or three-fourths white blood, and there is no end to the subdivision. This is philosophically unjust, and makes the negro element appear larger than it really is. It is also to be remembered that the blood of the Latin nations mingles with that of other races more readily than does the Saxon. The following statistics of the two main races at different dates show the percentage of negroes:

Year.	White.	Negro.	Per cent.
1804	234,000	198,000	45.8
1819	239,830	213,203	47
1830	332,352	423,343	56
1841	418,291	589,333	58.4
1850	479,490	494,252	50.75
1860	632,797	566,632	47
1869	797,596	602,215	43
1877	985,325	492,249	33
1887	1,102,689	485,187	30.55

*State of Missouri: Area, 69,415 square miles; population, 1,875,900.

†State of Virginia: Area, 42,450 square miles; population, 1,705,198.

It is especially worthy of note that for thirty or forty years the negro element has been both relatively and absolutely decreasing, and probably at the present time it composes a little more than one-fourth of the whole population.

The number of white persons of other blood than Spanish is trifling, and has been estimated at 10,500.

There is yet another class of population—the coolies, or Asiatic laborers imported from the Philippines. The statements of their numbers are so conflicting as to be a mere guess; but that guess would put them at 30,000 to 40,000.

The most recent official census is that of December, 1887. The figures in the following table are taken from it, and give the population by provinces, as well as the density of population (number of inhabitants per square kilometer) in each:

Provinces.	Inhabitants.	Square Kilometers.	Density.
Pinar del Río	225,891	14,967	15.09
Habana	451,928	8,610	52.49
Matanzas	259,578	8,486	30.59
Santa Clara	354,122	23,083	15.34
Puerto Príncipe ...	67,789	32,341	2.10
Santiago de Cuba..	272,379	35,119	7.76
Totals	1,631,687	122,606	13.31

LANGUAGE, RELIGION, AND EDUCATION.

The only language spoken in the island is Spanish.

The Roman Catholic has been the only religion tolerated. There are no Jewish or Protestant places of worship; while a person complying with all the requirements might be permitted to remain on the island, he would not be allowed to promulgate doctrines at variance with those of the established church. Catholicism is supported by the general revenues of the island, and all the items of expense are determined at Madrid. The amount estimated in the Cuban budget of 1893-94 is \$385,588.

The educational system of Cuba, under Spanish rule, is under the direction of the governor general and rector of the University of Habana, both being natives of Spain and appointed by the Crown.

The Royal University of Habana has five departments, viz, philosophy and letters, medicine, pharmacy, law, and science. There is a collegiate institute in each of the six provinces empowered to confer the degree of bachelor or licentiate. The total number of students in these institutes is 2,909. There is the Professional School of the Industrial Arts, with 53 students, and the Habana School of Painting, with 454. The total number of children attending the public or municipal schools was 38,106. The ratio of children attending the common school is 1 to 45, and including the higher schools and excluding the institutions of private benevolence it becomes 1 to 46, while the approximate ratio of the United States is 1 to 5.

The amount estimated for educational purposes was (budget for 1893-94) \$137,760, no part of which was in aid of any grade of common schools.

Education was made compulsory by a law of 1880, but that again is an instance of the difference between law and fact. The law is nugatory when there is not the disposition or ability to provide schoolhouses and teachers.

AGRICULTURE, COMMERCE, AND INDUSTRY.

Agriculture is not in a satisfactory condition. There is a lack of initiative and too much adherence to routine. The prosperity of the industry in the island is due more to the fertility of the soil and the excellence of the climate than to the energy or genius displayed in agricultural work.

The "ingenios" or sugar plantations, with large buildings and mills for sugar refining and distillation of rum, are the most important industrial establishments of the island. They vary in extent from 500 to 10,000 acres. Of late years, partly from the effects of the insurrection and partly from rapidly extending cultivation of beet sugar in other countries, the demand for Cuban sugar has been diminishing, and the sugar plantations have not flourished. The United States takes about 70 or 80 per cent of the sugar grown in Cuba, the greater part of the remainder passing on to Europe. The yield in 1894-95 was 1,040,000 tons, with an estimated addition of 400,000 tons of molasses.

Next come the "cafetales" or coffee plantations. They vary in extent from 150 to 1,000 acres, and even larger in the mountain districts. The number of hands employed is as

high as 100 in the low country, but the general average is 50 or 60 negroes to 1,000 acres. The first coffee plantation was established in 1748. Though at one time coffee was sent from Cuba in large quantities, it does not now figure largely in the exports. The amount produced from 1875 to 1885 was 24,000 hundredweight.

Tobacco is indigenous to Cuba, and its excellent quality is celebrated in all parts of the world. The best tobacco is raised in the country west of Habana, known as "Vuelta Abajo." The export for 1892 was 240,000 bales, and 166,710,000 cigars.

Among the other industrial establishments of Cuba may be mentioned the numerous cattle farms, cotton plantations, fruit and vegetable farms, cocoa plantations, and "colmenares," or farms devoted to the production of honey and wax.

There existed in 1894, 3,300 breeding farms, 1,500 sugar-cane plantations, 1,000 coffee plantations, 6,000 herds of horses, 13 cocoa-bean plantations, 9,500 tobacco fields, and 2,300 bee farms. In all, 100,000 city and 30,000 country estates, corresponding to 70,000 proprietors.

The imports consist mainly of jerked beef from South America, codfish from the British North American provinces, flour from Spain, rice from Carolina, Spain, and the East Indies, wine and olive oil from Spain, boards for boxes and barrels from North America, coal from Europe and North America, and petroleum from the United States, besides large quantities of British, German, and Belgian manufactures and hardware. Cattle are imported from Florida and the coasts of the Gulf of Mexico.

The exports consist of sugar, tobacco, coffee, brandy, copper, wax, honey, cotton, leather, horn, cocoanut oil, timber, and fruit.

There are no manufacturing industries of importance in the island.

EARTHQUAKES.

Earthquakes are frequent in the eastern part, particularly in the district of Santiago de Cuba, but are insignificant in the center, and very rare in the western department. The last one, which took place in 1880, was felt in the capital; it occasioned great havoc and ruin in San Cristóbal, and especially in Candelaria.

RAILROADS.

The first railroad built in Cuba was commenced in the year 1834, running from Habana to Güines, a distance of 44 miles. In 1837 a line was constructed from Nuevitas to Puerto Príncipe; also one from Cardenas to Bemba (Jovellanos). From time to time other lines were commenced, some of which were finished and are to-day a part of the railway system of the island; others were abandoned or consolidated. It might be said that they commence on the east at Santa Clara and terminate at Pinar del Río on the west, the objective point being the city of Habana. Though the various lines constituting the railway system of Cuba are owned by different companies, they either directly or by connection with other lines lead to Habana, to or from which the major portion of their traffic naturally comes or goes. Exceptions are to be found, however, in a few suburban plantations and local roads in the province of Santiago de Cuba and Puerto Príncipe, with possibly one or two similar lines elsewhere. There are in all some 1,100 miles of trackage on the island (not including the suburban and plantation roads, of which little information is obtainable). While the lines of roads, both in number and mileage, have been continually growing, railroad construction has received many set backs, through insurrection, the isolation of the island from the peninsula, financial and industrial stagnation, and the lack of energy and enterprise of the natives.

CONSTRUCTION.—The roadbed construction of the Cuban railroads is in accordance with both the American method of spiking the rails directly to the ties, and the European method of laying the rails on iron chairs and holding them there by wooden wedges. Some of the smaller companies have used both methods on the same line of road, so that it is utterly impossible to state how much of each kind of construction has been done.

While a considerable quantity of comparatively heavy steel rails of from 60 to 80 pounds have been used, by far the largest portion of the trackage is of light weight, and a large amount of iron rail is still in use.

All roadbeds are notoriously rough, generally from insufficient ballast, or where this originally has been put in from negligence in keeping the track properly surfaced, which in

a country possessing Cuba's peculiarities as to soil and heavy rains, should be carefully looked after.

Should it be found necessary during military operations in the island to tear up and destroy tracks, which have been built according to the American method, it should be borne in mind that owing to the hardness of the ties (in some instances the ties being of mahogany and ebony), it would be found almost impossible to draw the spikes, the better plan being to throw the track over bodily and build fires on it. Of course, where the European method of construction has been followed, the hardness of the sleepers will prove of little consequence.

Do not take it for granted that, should a railroad bridge or trestle be seen in the distance, or be shown on the map, it will afford a means for marching troops across the streams or chasms, as the rails over the trestles are generally laid on heavy longitudinal girders of heavy wood. The girders are held in position by widely spread trusses mortised into their lower sides, not a tie being used. Hence for foot passage there is available only two longitudinal narrow strips over which it would be difficult to walk. Some of the trestles could be floored by placing planks across them, resting on the longitudinal beams. Many of the trestles and bridges were dynamited by the insurgents during the past two years, but undoubtedly are, ere this, repaired.

The railways generally are single track and standard gauge (4 feet 8½ inches), having but few switches or turn outs, and it is unnecessary to say, free from modern safety appliances.

The telegraph service, until recently, has been notably poor, many of the railways being entirely destitute of either telegraph or telephone service. It is understood, however, that Governmental necessities have caused them to be much improved of late.

Railroad building in Cuba is accompanied by many obstacles. On the table-lands are found streams and chasms which must be trestled, numerous hills and ridges to be cut through, while the forests with their luxuriant growth of vegetation are almost impenetrable. In the lowlands are to be found large swamps and marshes, which must be crossed, dense forests and numerous low-banked streams which so often overflow their banks and flood the whole country. Besides, the climatic conditions are not the most seductive to the railroad contractor.

ROLLING STOCK.—The rolling stock consists principally of the American type of locomotives and cars, although not all are of American manufacture. The locomotives are wood burners and neither they nor the passenger and freight coaches are as large as those used in this country. In fact, all the equipment reminds one of the small American railways of thirty years ago.

MILITARY TRAINS.—The military trains, of which so much has been heard during the present strife in Cuba, are to be found, not only on the trocha military roads, but on nearly every railway line in Cuba. They ordinarily consist of a locomotive, an armored car, and then a car containing every kind of construction and wrecking material. Frequently the military trains run as pilots just ahead of the ordinary trains, and occasionally a passenger car or two is attached to the train above described.

COMPANIES.—The principal companies comprising the railway system of Cuba are:

Ferrocarriles Unidos, with lines from Habana to Guanajay; Habana to Matanzas and Bemba; Habana to Batabano; Habana to La Union; Güines to Matanzas.

Ferrocarril Occidente, running from Habana to Pinar del Río, owned by an English syndicate.

Ferrocarriles Cardenas-Jucaro, running from Cardenas to Santa Clara, Bemba, and Colongeto.

Ferrocarril de Matanzas, from Matanzas to Murga and Navajas to Venero San Juan.

Ferrocarril Cienfuegos-Santa Clara, from Cienfuegos to Santa Clara, with several branches.

Ferrocarril de Sagua La Grande, from La Isabel to Cruces, through Sagua La Grande.

Ferrocarriles Unidos de Caibarien, from Cifuentes to Caibarien; Mamjuani, etc.

Ferrocarril de Puerto Príncipe, from Puerto Príncipe to Nuevitas, a coast town.

Ferrocarril de Guantanamo, a short line connecting Guantanamo with the coast (Caimanera).

There are a number of other companies of more or less local importance, but of which little mention need be made. A full description and itinerary of each road will be given according to province.

MACADAMIZED ROADS AND TURNPIKES.

A liberal number of these roads are shown on maps, but too great reliance on their actual and entire existence should not be had because of this fact.

A word concerning the ordinary routes of travel should be said, which will fittingly apply to the railway systems of the island. Internal means of communication, on an extensive scale, seems never to have been considered as essential to Cuba. The island is long and narrow, and possesses many fine harbors. Transportation of commodities is, therefore, carried on by water; the land transport being confined to the short trips from the inland towns to the seaports. The utilization of such means for every character of trade has been far more extensive than is indicated by any list of coast-line steamships. The natural tendency of travel by land has therefore been to the nearest seaport. If it be an important town, a scanty railway system may extend to the interior, and perhaps, by accident more than anything else, connect with some other railroad, or some improved highways may have been built to a certain extent for a moderate distance. But either railroads or highways can be considered only as abbreviated main stems of travel, terminating short of the points which they should reach. Highways especially show less and less improvement and care as they extend away from their important terminals. An entire absence of improvements may occur for some miles, to be renewed again as the road approaches some other important town. A few miles of bad road in either direction from a main line of travel, or of intercepting branch lines, is considered a matter of little importance by the natives or even by some map makers.

The principal roadways will be taken up separately with reference to the province in which they are situated, and their location and importance.

THE TROCHAS.

The trocha is a clear space from one hundred to two hundred yards wide, on either side of which trees and stumps are piled up forming a barrier through which it is almost impossible to pass. At intervals along this clear space is a fort of blockhouses. These blockhouses are of three kinds. The larger one consisting of a two-story stone house, with a cellar beneath and a watchtower above, from which can be seen the

next fort. On many of the towers are placed powerful electric search lights. Rifle holes pierce the walls of both stories, and in many of these fortifications small fieldpieces are placed. To infantry or cavalry they present a very formidable object unless heavy guns be brought to bear on them, which would be prevented by the almost impenetrable jungle on both sides of the trocha. A quarter of a mile from the large fort is a two-story blockhouse, the upper portion being constructed of wood and the lower portion of mud and rock. Between the two large blockhouses above described there are from one to four smaller houses, resembling cattle pens. They are mere sheds, holding from five to ten men, having iron roofs and their sides boarded up with heavy plank so that a person can barely look over them when standing in the blockhouse. Between the blockhouses are strung innumerable strands of barbed wire, and along many of the trochas bombs are placed at intervals.

On many of the trochas a railroad traverses the center of the clearing, serving to transport troops and supplies to various portions of the trocha. The trains on these roads generally consist of an engine, and then an iron car or two, whose sides are pierced with rifle holes. Following the protected coaches is a car containing various construction and wrecking material.

While the Spaniards have placed great reliance in the trocha as a system of defense, their heavy barricade of timber on either side would make an excellent hiding place for infantry, which could pour a raking fire into the enemy within. Besides, the trocha is not sufficiently wide to permit the maneuvering of large bodies of men.

THE MARIEL-ARTEMISA-MAJAMA TROCHA.

[March 31, 1896.]

The Mariel-Artemisa-Majama trocha seems to be giving good results. Further details are as follows: The works, over 600 in number, cover 32 kilometers—from the banks of the River Freire (border of the Ciénaga) to the fortified houses of Mariel—and are divided into three zones.

ZONE SUR (Ciénaga to Artemisa).—In this zone it was necessary to cut the military line, a roadway through much timber or undergrowth. It has, as key-points for defense, the ranches or mills of Maravillas, Neptuno, Montoto, Santa Ana,

Gabriela, and Ponton, and all are connected by small forts at a distance, as a rule, of not over 400 meters apart. The forts are defended in front by lateral trenches of various forms, a small space being left for a sortie. This space is covered in advance by stockade, barbed wire, abatis, trous-de-loup, etc. The line is so prepared, however, that defense may be made as well against an attacking force from the east.

ZONE CENTRAL (Artemisa to Guanajay).—This part of the line has a fine highway, and the ground generally is open; it has few hills and but little undergrowth. The defense here is almost a continuous wall formed by the highway. Key points are in mills or ranches of Portazgo, San José, Capote, Virtudes, Calloa, and Castellano. The wall referred to is covered by detached forts and intrenched camps, revealing an extraordinary amount of labor.

ZONE NORTE (Guanajay to the ocean, near Mariel).—Considerable broken ground or country crosses this section of the line. The base of defense, however, is the highway, with fortifications west and east in the Lomas. Key points are San Francisco, Cañitas, Martín, Mesa, Zayas, and Las Cañas.

Great care has been taken in all the works, slopes being grassed, trenches sheltered from water, and boxes provided for sentinels. The maximum distance from each other for sentinels at night is 50 meters; patrols are constantly out in advance, and mounted officers constantly pass up and down the line to see that the orders for proper vigilance are carried out. The force on the line numbers some 12,000 men, with 30 guns, and 1,000 horses. A flying column, for use in case of an attack by the enemy, is stationed at Artemisa. This consists of four squadrons and six rapid-fire guns.

The movable reserve of cavalry, with two pieces of rapid-fire guns, is held near the Pilar sugar works.

ZONE SUR.—The special reserves for Mariel-Guanajay are held at the sugar plantations of Cañitas, Zayas, and San Francisco. The town of Guanajay is covered by a number of detached forts.

ZONE CENTRAL.—Guanajay-Artemisa is a very open country. It has intrenched camps in Castellano, San José, Virtudes, and Portazgo. This zone is practically a continuous line of wall, covered by detached works. The city of Artemisa is well fortified.

ZONE NORTE.—The reserves for Artemisa-Majama are held at the sugar plantations of Waterloo, Montoto, Neptuno, and Maravillas. This zone has a continuous line of forts and trenches. The force in the line consists of about 13,000 men.

This trocha is now (May 1, 1898) reported to be abandoned and to offer no serious opposition to an advance of troops.

JUCARO TROCHA.

[August 4, 1896.]

So pleased are the Spanish with the Mariel trocha that steps have been taken to repair that of Jaruco, famous in the last war. At the present time, in the 61 kilometers (39 miles) of its length, there are only 10 small forts, with a force of some 620 infantry and 50 cavalry. The line, now in the hands of the engineers, will cover 66 kilometers—63 from Jucaro to Morón and 3 from Morón to the creeks. It will follow at a distance of 70 meters the line of the railway. Its garrison force is placed at 3,000 men, but this will no doubt be soon increased. The works of defense will be of stone and mortar, of two stories, with watch tower 8 meters above ground, with telephone, and with powerful electric-light reflectors. Every six forts will have its garrison camp. The watch tower, it is contemplated, will be covered with railroad iron. There are three lines of torpedoes (4,000 in all) in the present plans, the torpedo defense covering 600 meters in each kilometer, the forts and trenches defending the remaining 400 meters. In each line the torpedoes will be placed at intervals of 8 meters. All timber and brush will be cut down for a distance of 500 meters on each side of the line. Water will be furnished by tubular (driven) wells. The cost is estimated as follows:

	Pesos.
Seventy reflectors	150,000
Torpedoes	140,000
Wells	40,000
Auxiliary defenses	55,000
Sundries	25,000
Telephones	30,000
Total	440,000

[July 18, 1897.]

The Jucaro trocha is reported on June 22 as having completed 60 towers or forts, 12 fortified camps, 5 fortified barracks, and a zone (lighted), 6 yards wide and 68 kilometers long, from

Jucaroto to the Lechelake. Each tower contains an electric-light reflector and a telephone station. All undergrowth is cut away for 150 yards on each side of the line railroad, and this road has been placed in thorough order. A track has been placed in swampy ground from Morón to Laguna Grande (6 miles). The electric lights disclose the condition of the road clearly for 700 yards, the light being so powerful as to permit the reading of manuscript at that distance. The towers are 1 kilometer apart.

[February 10, 1897.]

Some 60 forts have been erected here and, abandoning the use of torpedoes, some 210 blockhouses are being placed between the detached forts.

This trocha was reported to be garrisoned by 12,000 men in November, 1897.

CITY OF HABANA.

DESCRIPTIVE.

(37)

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CITY OF HABANA.

HISTORICAL SKETCH.

Habana does not enjoy the distinction of being the first capital of the island of Cuba. This honor belongs to Baracoa.

Diego de Valazquez, the conqueror of the island, on July 25, 1518, founded a town on an unhealthy site, at the mouth of the river Güines (where the present city of Batabano is located), which he called San Cristóbal. Shortly afterwards it was moved to the mouth of the Río Almendares, and in 1519 to its present site and its name changed to Habana. The town grew very rapidly, and was soon considered as one of the foremost places in the New World.

In 1538 the town was destroyed by French buccaneers, but was soon restored by Hernando (or Fernando) de Soto, who erected the first fort—La Fuerza.

In 1550 the residence of the captain general and the seat of government were transferred to Habana from Santiago de Cuba, which was at that time the capital of the island.

From 1551 to 1555 the city was repeatedly plundered by Jacob Sores and his band of pirates, and in 1585 was threatened by Drake. For the protection of the city against the numerous bands of pirates which infested the West Indies, Philip II. ordered, and Captain General Don Juan de Tejada caused the erection of the Bateria de la Punta and the much celebrated "El Castillo del Morro," of which so much has been written during the war just passed.

From the beginning of the Seventeenth Century Habana seems to have suffered less from pirates, and to have passed the next one hundred and fifty years of its life in comparative peace.

In 1634 the importance of the place received royal recognition, and by the royal cedula of May 24 Habana was called "Llave del Nuevo Mundo y Antemural de las Indias Occidentales" [Key of the New World and Bulwark of the West Indies].

In 1646 defensive towers were erected on the coast at Chorrera and at Cojimar.

In 1652 Governor Gelder proposed the construction of a canal from the shore of the bay, where now stands the arsenal, to the gulf near the present *calzada de San Lazars*, partly as a defensive work, partly for the purpose of purifying the fever-breeding bay. Instead of that, a defensive wall around the city was constructed at an enormous cost: This wall was demolished and removed in 1880.

In 1665 the city was confirmed in the use of a coat of arms, long before adopted.

In 1724 the navy yard, now the arsenal, was erected.

During the year 1730 a new wall was begun from *La Punta* along the shore of the bay, and is still standing as part of the present sea wall.

In 1762 the English, under Admiral Pococke and Duke of Albemarle, attacked the city, and on August 14, after a two months' siege, Habana was surrendered, but was restored to the Spaniards on February 10, 1763, by the treaty of Paris, in exchange for the Floridas.

The capture of the city by the English proved such a valuable lesson to the inhabitants that the thirty-five years which followed (1763-1798) saw the beginning and completion of all the great defensive works now existing around the city.

In 1782 was published *La Gaceta de la Habana*, the earliest newspaper in the island.

In 1780 the Jesuits were expelled from the city and their church became the cathedral of Habana.

The urn containing the ashes of Columbus was deposited in the Habana Cathedral in 1796.

The port of Habana, in common with others of the island, was by law opened to foreign commerce in 1818.

Many useful institutions, as well as material improvements and embellishments of the city, are mainly due to Captain General Don Miguel Tacon, such as the fire brigade, the theater which bears his name, and several of the finest public promenades.

The first railway on the island, running from Habana to Güines, was commenced in 1835; and in 1837 the first ferry was established, between the city and Regla, a suburban town just across the bay.

In 1850 the first steamship line was established, between Cadiz and Habana.

From 1868 to 1878 occurred the first Cuban revolution, which affected Habana's commercial interests very little.

From 1896 to 1898, during the revolution just past, under the régime of General Weyler, the city's commercial interests suffered greatly.

From April 22 to August 12, 1898, the city was blockaded by the American fleet, and for a portion of this time the inhabitants were on the verge of starvation.

COAT OF ARMS.

The coat of arms mentioned in the historical sketch consists of a shield bearing three castles, argent, upon a field of azure, and a golden key—an allusion to the three fortifications guarding the mouth of the harbor and to Habana being the key of the New World. Above is a crown, and for the border the necklace of the Golden Fleece. The coat of arms was adopted early in the Seventeenth Century, but was not confirmed by royal order until 1665.

LOCATION AND POPULATION.

The capital and largest city of the Island of Cuba, having a circumference of $6\frac{1}{4}$ miles, is the great center of everything of social, commercial or military importance on the island, not only on account of its possessing a population so much greater than that of any other city, but from its attractiveness and the fact that as the capital of the island, as well as the capital of the province of its name, the operations of the whole government machinery have naturally tended to bring everything of importance about it. It is actually more of a Spanish than a Cuban city. Habana (once called the key of the Spanish dominions in America) is situated on a level peninsula on the west side of the Bay of Habana, formerly called Carenas Bay, in latitude $23^{\circ} 21'$ north, and longitude $32^{\circ} 21' 30''$ west, as determined telegraphically by Lieutenant Commander F. M. Green in 1876. Including its suburbs, the city is estimated to have a population of over 300,000, while that of the city proper is given as 200,448, about 70 per cent being white and 30 per cent colored.

The environs of Habana comprise several populated towns, among which are: El Cerro, immediately adjacent; Tulipan, a residence suburb, really a part of El Cerro; Cojiman, $3\frac{1}{4}$ miles east of the city, a summer resort; La Playa de Marianao, a summer resort; Marianao, a residence suburb of about 2,000 inhabitants, very healthy, about 6 miles away; and Guanabacoa, 3 miles distant, with a population of perhaps 20,000.

CLIMATE, METEOROLOGICAL CONDITIONS, EARTHQUAKES, ETC.

The climate of Habana is essentially tropical, although the excessive heat is tempered by the sea breeze, which blows regularly every morning, and by the "terral" (land breeze), which blows every evening.

There are two seasons, the dry, or so-called winter season, from November to May, when very little rain falls, and the wet, or summer season, which usually begins early in June and lasts until the middle of October, during which period scarcely a day passes without heavy rains, frequently accompanied by violent thunder and lightning.

The mean temperature during the day is 80° during the winter and 86° to 90° in the summer. The mean annual temperature is 78° for the hottest month and 70° for the coldest.

The atmospheric humidity averages over 80 per cent at all seasons, being largely due to the insular situation.

The incomplete data and observations made upon Cuban territory render it almost impossible to give very exact information; it is thought, however, that the following table, giving the number of rainy days, taken from the "Historia física, política y natural de la Isla de Cuba," by "de la Sagra," though somewhat prejudicial, will be found useful:

TABLE OF THE METEOROLOGICAL CONDITIONS OF HABANA.

Months.	Tem- pera- ture.	Humid- ity.	Rainy days.	Rainfall.	Condition of sky.	
					Cloudy days.	Clear days.
	° F.	Per cent.		Inches.		
January	71	82	8	2.5	5	26
February	74	84	7	2.1	8	20
March	74	82.8	6	2.4	7	24
April	76	82.4	4	1.2	5	25
May	78	85.4	8	3.6	8	23
June	81	85	10	5.1	6	24
July	82	87.6	12	5.6	6	25
August	82	88.2	12	4.8	6	25
September	80	88.2	14	6	7	23
October	79	85.2	9	3.2	7	24
November	75	86.2	8	3.3	8	22
December	73	84.8	6	1.2	7	24
Means or totals	77	85.15	104	41.0	30	285

According to the same authority, the highest temperature observed at Habana during a long period was 90° and the minimum 50°.

Rarely are there more than twenty rainy days in any one month, and the average is from three to ten. The rainfall generally occurs in the afternoon, there being only about seventeen days in a year in which it rains in both the forenoon and the afternoon.

Such effects—with the splendid sun, the few completely cloudy days, copious rains in the warmest season, and cool breezes when the rain falls—make Habana for vegetation a terrestrial paradise, and, for climate, one of the best of inter-tropical regions. In January it is warm, but not hot during the day, and the evenings are so cool as to make a light coat necessary.

Visitors from the far north are impressed with the distinctness of distant objects, due to the great transparency of the atmosphere. At night, too, the air does not seem to lose its clearness.

Spring begins in May, and thenceforward until fall thunderstorms are of almost daily occurrence. Hurricanes are frequent, but only at long intervals do they prove disastrous, as were those of 1844, 1846, 1865, and 1870.

There are no active volcanoes on the island of Cuba, and the earthquakes that occur are seldom destructive, existing chiefly in the Province of Santiago de Cuba, and rarely communicating the earth's convulsions as far as Habana.

HILLS AND ELEVATIONS.

There are many important hills and elevations within or adjacent to the city of Habana. The highest is called Jesus del Monte, 220 feet above the level of the sea.

Loma de Marza, the most important hill of the group from a strategic point of view, received the name of "The Key Hill" on account of its advantageous position.

Many of these hills and elevations are surmounted by castles or forts.

Castillo del Morro, one of the oldest, is situated at the entrance of the harbor on an elevation 75 feet above sea level.

Castillo de la Punta is diagonally opposite El Morro Castle, farther on at the entrance.

Castillo de la Cabaña dominates the playa (sea coast).

Castillo del Principe, $2\frac{1}{2}$ miles distant, on the hill of same name, 150 feet in height, juts out into the southern valley.

This latter hill, it is said, in combination with the hill called El Cerro, and another called Atares, upon which is the Castillo de Atares, when fortified, could command the valley south and southwest of Habana Bay.

TERRITORIAL DIVISIONS.

While in reality the city is not divided, it is commonly recognized as being in two parts, viz: The intramural, or old town, between the bay and the site of the ancient walls, and the extramural, or new town, beyond the walls.

STREETS.

In the old town the streets, though for the most part regular and well paved, are extremely narrow, and being lowest in the middle, favor the accumulation of great pools of water in the rainy season. The sidewalks are barely wide enough for two pedestrians to pass.

In the old intramural city, in which live about 40,000 people, the streets vary in width, but generally they are 6.8 meters (about 22 feet) wide, of which the sidewalks occupy about 7.5 feet. In many streets the sidewalk at each side is not even 18 inches wide.

The older a Cuban city, or any part thereof, the narrower the streets. One-fifth of the population of Habana live within the now demolished walls, and this "intramural" population possesses streets so narrow that on every corner is posted either "Up" or "Down" to indicate to all vehicles that they must pass only in the direction indicated. As time extended the city farther and farther beyond its walls, the streets gradually became wider, until some attained the ordinary dimensions usually found in the United States. Matanzas, Cardenas, and Cienfuegos were founded subsequently to Habana, in the order mentioned; therefore Matanzas has many narrow streets, but not as narrow as Habana; Cardenas few, and Cienfuegos none. The narrower the streets, the smaller usually the house lots, and the more defective the ventilation of the houses; however it should not be forgotten that these are for the most part one-story houses, and that wider streets afford no better ventilation to houses with several or many stories. Less than one-third of the population live on paved streets, and these are as well paved and kept as clean, it is

believed cleaner, than is usual in the United States. The remainder live on unpaved streets, which, for the most part, are very filthy. Many of these, even in old and densely populated parts of the city, are no better than rough country roads, full of rocks, crevices, mud holes, and other irregularities, so that vehicles traverse them with difficulty at all times, and in the rainy season they are sometimes impassable for two months. Rough, muddy, or both, these streets serve admirably as permanent receptacles for much decomposing animal and vegetable matter. Finally, not less, probably more, than one-half the population of Habana live on streets which are constantly in an extremely insanitary condition; but these streets, though so numerous, are not in the beaten track of the pleasure tourist.

The macadamized thoroughfares of the city, in the new part, rather resembling fine roads than streets, are ample, well ventilated, and fringed on either side with rows of graceful palm trees.

The principal business streets are O'Reilly, Obispo, and Obrapia. In the new extramural town the streets are generally 32.8 feet wide, nearly 10 of which are devoted to the sidewalks.

ARCHITECTURE.

The prevailing style of architecture is almost identical with that of the south of Spain.

The walls of most of the houses in Habana are built of "mampostería" or rubble masonry, a porous material which freely absorbs atmospheric as well as ground moisture. The mark of this can often be seen high on the walls, which varies from 2 to 7 feet in the houses generally.

The walls themselves are very thick, often painted within and without in showy colors, especially blue, green, or yellow, and sometimes a mingling of all three. The roofs are excellent, usually flat, and constructed of brick tiles. The windows are, like the doors, unusually high, nearly reaching the ceiling, which, in the best houses only, is also unusually high. The windows are never glazed, but protected by strong iron bars on the outside and on the inside by solid wooden shutters, which are secured, like the doors, with heavy bars or bolts, and in inclement weather greatly interfere with proper ventilation. Fireplaces with chimneys are extremely rare, so that ventilation depends entirely on the doors and windows,

which, it should be stated, are by no means unusually large in most of the sleeping rooms of the poor. Generally in Habana, less generally in other cities, the entrances and courtyards are flagged with stone, while the rooms are usually floored with tile or marble. With rare exceptions the lowest floor is in contact with the earth. Ventilation between the earth and floor is rarely seen in Cuba. In Habana the average height of the ground floor is from 7 to 11 inches above the pavement, but in Habana, and more frequently in other Cuban towns, one often encounters houses which are entered by stepping down from the sidewalk, and some floors are even below the level of the street. In Habana some, in Matanzas more, in Cardenas and Cienfuegos many of the floors are of the bare earth itself, or of planks raised only a few inches above the damp ground.

More than two-thirds of the population live in densely-inhabited portions of the city, where the houses are closely in contact with each other. The average house lot does not exceed 27 by 112 feet in size. There are 17,259 houses, of which 15,494 are one story, 1,552 are two stories, 186 are three stories, and only 27 are four stories, with none higher. At least 12 in every 13 inhabitants live in one-story houses; and as the total civil, military, and transient population exceeds 200,000, there are more than 12 inhabitants to every house. Tenement houses may have many small rooms, but each room is occupied by a family. Generally the one-story houses have four or five rooms; but house rent, as also food and clothing, is rendered so expensive by taxation, by export as well as import duties, that it is rare for workmen, even when paid \$50 to \$100 a month, to enjoy the exclusive use of one of these mean little houses; reserving one or two rooms for his family, he rents the balance. This condition of affairs is readily understood when it is known that so great a necessity as flour cost in Habana \$15.50 when its price in the United States was \$6.50 per barrel.

In the densely populated portions of the city the houses generally have no back yard, properly so called, but a flagged court, or narrow vacant space into which sleeping rooms open at the side, and in close proximity with these, at the rear of this contracted court, are located the kitchen, the privy, and often a stall for animals. In the houses of the poor, that is, of the vast majority of the population, there are no store-rooms, pantries, closets, or other conveniences for household

supplies. These are furnished from day to day, even from meal to meal, by the corner groceries; and it is rare, in large sections of Havana, to find any one of the four corners of a square without a grocery.

Many of the residences in the extramural portion of the city are constructed in a more modern style, particularly in El Cerro (The Hill), a handsome street, 3 miles long, leading to a village of the same name, and chiefly inhabited by the wealthy and fashionable. There is, however, no quarter of the town exclusively occupied by the higher classes, and in any street a miserable hovel may be seen side by side with a stately mansion.

PUBLIC EDIFICES.

Foremost among the public edifices of Habana is the Cathedral, erected in 1724 and used by the Jesuits as a college till 1789. It is less remarkable for the beauty of its architecture than as being the resting place of the ashes of Christopher Columbus, transferred thither from Santo Domingo January 15, 1796. On one of the walls is a stone slab with the bust of Columbus in relief and an inscription beneath.

Santa Catalina and San Juan churches, dating from the Sixteenth Century, and the Church of San Augustin from the beginning of the Seventeenth Century, are noteworthy for the richness and splendor of their decorations.

El Templete (the Little Temple) is curious as having been erected in 1828 on the spot where the mass was first celebrated in 1519.

On the west side of the Plaza de Armas is the Governor's Palace, a yellow two-story edifice, with a handsome colonnade in front; it is occupied by the captain general, his staff, and the offices of several government departments.

The Custom-House, fronting on the bay, is a spacious building, devoid of architectural interest.

The Customs Warehouse, formerly the church of San Francisco, consecrated in 1737, possesses the loftiest tower in the city.

La Real Casa de Beneficencia (Royal Charitable Institution) is a large building, with beautiful grounds. It comprises an orphan asylum and an asylum for vagrants, established about 1790.

La Prision (Prison) is a vast quadrangular structure, erected in 1771, near the mouth of the bay.

The Admiralty, Exchange, and University are also worthy of mention.

El Tacon, a theater built in 1838 under the auspices of Captain General Tacon, whose name it bears, is said to be equal in size to La Scala, of Milan. It is capable of accommodating about 3,000 persons.

PUBLIC PARKS.

Few cities in the world have a larger number of *paseos* (public promenades) and public parks than Habana. Those worthy of mention are:

The Plaza de Armas, a short distance from the quays, comprises four gardens, with a statue of Ferdinand VII. in the center. Magnificent palms and other trees border the walks, along which are stone seats with iron rests. A regimental band plays here every evening.

La Alameda de Paula, bordering the bay, has an elegant fountain, surmounted by a marble column, with military trophies and national symbols.

The Parque de Isabel is a favorite evening resort, tastefully laid out. In the center is a statue of Isabella II.

The Campo de Marte, used as a drill ground for the military, is a large enclosure resembling a trapezium in shape, the longest side of which is 375 feet. It has four handsome gates, distinguished respectively by the names Colon, Cortes, Pizarro, and Tacon.

El Pasco de Tacon is a magnificent wide drive, with double rows of trees, a promenade for pedestrians, and profusely embellished with columns and statues, some of the latter, especially one of Charles III., ranking among the finest specimens of art in America.

The Botanical Garden is remarkable for a beautiful gate and specimens of countless tropical plants.

La Reina, El Prado, La Cortina de Valdes, and El Salon de O'Donnel, are also *paseos* worthy of mention.

HABANA BAY AND HARBOR.

The entrance to the port of Habana may be easily recognized by the Morro Castle and lighthouse, with the extensive line of fortifications on the eastern side of the entrance. The land to the eastward of the city, until near the Jaruco or Iron Mountains, 18 miles distant, is about 200 feet high, and the shore bold and steep-to.

Nine miles south of the Morro there is a remarkable isolated hill, 732 feet high, with two round hummocks, called the Managua Paps. This hill is not only an excellent guide for Habana when coming from the northward, but useful also as a point of departure.

The channel for about $\frac{1}{2}$ mile is not more than 200 yards wide; farther in it widens, opening into a basin of irregular shape, $2\frac{1}{4}$ miles long and from $\frac{1}{2}$ to 1 mile wide.

Morro Point is steep-to, and vessels of large draft may pass quite close to it. Soundings extend off from the point $\frac{1}{2}$ mile. A shoal spot, with a depth over it of $26\frac{1}{10}$ feet, exists between 120 and 150 yards from the shore line at Morro Point, the lighthouse bearing N. 20° E. (N. 17° E. mag.). The northern shore of the channel is bordered by the Cabrestante Bank, which, at the outer part, extends off more than 100 yards.

Both sides of the channel are marked by buoys, which are, however, frequently out of place. Men-of-war can, generally, by applying to the captain of the port, obtain a mooring buoy to lie at.

Within the harbor the western shore is bold, and vessels lie alongside the wharves. The arsenal is in the southwest angle of the harbor.

The city is strongly fortified, there being several forts and castles. The streets are narrow and dirty, and there is no sewerage. Yellow fever is endemic. The sickly season is from June to October. As there is little ebb and flow of the tide in the harbor, the water is filthy and foul smelling. As a sanitary precaution, it is advisable to anchor as far from the southern light of the harbor as possible. The water should not be used for washing decks or clothing.

Hospitals are: Military, leprous, charity, and several private hospitals; also insane asylum.

Police are efficient and numerous.

Provisions of all kinds can be obtained in abundance. Water can be had from water boats which come alongside; it is good but hard, and is furnished to shipping at 75 cents per 100 gallons. An aqueduct supplies the city.

The usual supply of coal on hand is about 90,000 tons; cost, \$8.50 to \$10 per ton. Vessels can coal alongside the coal dock.

There is telegraphic communication with all parts of the world. There are many steamer lines to the United States and Europe.

A railroad runs to the principal places on the island.

The authorities are: Captain general, comandante de la marina, a vice admiral, captain of the port (naval officer).

Salutes will be returned.

The United States is represented by a consul general, a vice consul general, and a deputy consul general.

DOCKS.—At the naval arsenal are ways capable of taking up vessels of not over 500 tons.

There are several machine shops where steamers may repair.

Pilotage compulsory on all vessels except vessels of 50 tons and those engaged in the coasting trade. Night pilotage double day rates. For changing anchorage half pilotage is charged.

RATES.—Vessels of 50 tons, \$5; 51 to 100 tons, \$6; 101 to 150 tons, \$7; 151 to 200 tons, \$8; 201 to 250 tons, \$9; 251 to 300 tons, \$11; 300 to 350 tons, \$13; 351 to 400 tons, \$17, and \$1 additional for every 100 tons additional up to 1,000 tons; 1,001 to 1,250 tons, \$24; 1,251 to 1,500 tons, \$25, and \$1 additional for every 500 tons additional up to 5,000 tons; 5,000 tons and upwards, \$32.

Anchorage dues vary from \$2 for vessels of from 51 to 75 tons to \$8.50 for vessels of 5,000 tons and upwards.

There are no tonnage or light dues.

Vessels of 200 tons pay \$17 tugboat charges; of 700 tons, \$60, from 1 mile outside the Morro to the anchorage.

The mooring charges are: For from 151 to 200 tons, \$2.75; for 300 tons, \$3, and 50 cents additional for each 100 tons. For 5,000 tons and upwards, \$8.50.

Tonnage tax, 3 cents per ton.

BUOYS AND BEACONS.—Three black buoys mark the northern entrance to Habana Harbor, and are named, respectively, Apostales (2) or outer buoy, Pescante (4), and Pastora (6). The southern side is marked by three red buoys called Punta (1) or outer buoy, San Telmo (3), and Pescadera (5).

When vessels are entering by night, a red light is placed on Apostales (2) buoy and a green light on San Telmo (3) buoy.

Feliciano Shoal, north side of the harbor, is marked at the south extreme by a triangular beacon, painted white.

Regla Shoal, opposite the harbor entrance, is marked on the eastern side by a triangular beacon, painted white; to the northwestward by a buoy; on the western side by a triangular beacon, painted white.

The bank northwest of Cayo Cruz is marked by triangular beacons, painted white.

Warping buoys are moored westward of Regla Shoal for vessels of war, and eastward of that bank for merchant vessels.

TIME SIGNAL.—A black ball is hoisted daily on the flagstaff of the office of the naval commandant at ten minutes before noon. The ball is dropped at exactly mean noon for the meridian of said building, equivalent to 5h. 29m. 23.55s. Greenwich mean time.

If for any reason an error is made in dropping the ball, it will be indicated by hoisting a blue flag on the same flagstaff, and the ball will be run up again at 0h. 50m. p. m. and dropped exactly at 1h. p. m.

SEMAPHORE.—A semaphore has been established on the highest part of Morro Castle. The semaphore is connected by telegraph with the interior of the island, and messages can be sent to or from vessels from or to places in the interior, at fixed charges.

STORM SIGNALS.—During the hurricane season the following storm signals will be displayed, successively, from the office of the captain of the port and repeated by semaphore from the Morro:

Day signals.	Night signals.	Indications.
A triangular red flag-----	A red light-----	Signs of bad weather.
A square flag with yellow and blue horizontal stripes.	A red light over a white light.	Decided indications of bad weather.
A black ball-----	(No night signal)-----	The port is closed.
A black ball over a triangular red flag.	A white light over a red light.	Indications of clearing weather.
A black ball over a square flag with yellow and blue horizontal stripes.	A white light-----	Clearing weather.

Vessels lying at the moles will send down light spars and strengthen their moorings as soon as the signal, "Signs of bad weather," is made.

LIGHT.—A lighthouse, stone color, stands on Morro Castle at the entrance of the harbor, and exhibits a white light, revolving every half minute at 144 feet above the sea, and should be visible 18 miles.

TIDES.—It is high water, full and change, in Habana Harbor, at 8h. 14m., and the rise is about 3 feet. There is no

regular flood and ebb, but with the land wind a slight stream usually runs out.

DIRECTIONS BY NIGHT.—1. Vessels approaching the harbor should make for a position about 2 miles northwest by west from the entrance, with the harbor open, and should not proceed farther if a vessel is coming out, the signal for which is a white light over a red light hoisted at the harbor master's office, until such vessel is outside the entrance.

2. From the above position the vessel wishing to enter should fire a rocket, or show a Bengal light (a steamer with mails on board may also fire a gun), which will be answered by a similar signal from the pier of the harbor office to indicate that a pilot is coming out. The pilot boat will show a flare-up light occasionally, and the vessel should gradually approach the entrance so as to be boarded about a mile outside.

3. If the weather will not allow the pilot to come off, the vessel may enter, provided that a red light is shown on the Apostoles buoy, on the port hand entering from seaward, and a green light on the San Telmo buoy, on the starboard hand. The vessel will then be boarded by the pilot between the buoys.

4. If the signal for a pilot is not answered, it should be repeated, until made three times, at intervals of ten minutes; when, if no answer is given, it indicates that for some reason the port can not be entered by night.

GENERAL DIRECTIONS.—Vessels bound to Habana from the westward, having rounded Cape San Antonio, with the usual trade wind at east, should not steer higher than north ($N. 3^{\circ}$ $W.$ mag.) for 15 miles, when they may haul to the wind, and the chart must be their guide along the Colorados. Here, however, the current generally sets to the southwest on the edge of the bank. It will, therefore, be better to stand to the northward as far, at least, as the parallel of 24° before tacking.

Vessels bound to Habana from the north and east will navigate either by way of the northwest Providence Channel, across or along the western edge of the Great Bahama Bank, round the Elbow of the Double-headed Shot Cays, and thence across toward Guanós Point in Cuba, out of the stream; or through the Old Bahama Channel.

Entering under sail, time will be saved by waiting until the sea breeze has set well in, which commences about 10 a. m. In the winter months, from October to June, a vessel will

generally fetch up at the anchorage; but in the summer, as the wind prevails to the southward of east, she may have to warp in. In the former case, if coming from the eastward, after passing the Jaruco tower and bank westward of it, run down about $\frac{1}{2}$ mile or more off shore, and having brought the lighthouse to bear about S. 20° E. (S. 23° E. mag.) (not before, in order to avoid any sweep), haul up under all plain sail, so as to shoot as far in as possible, and with both anchors clear.

Having passed Morro Point at the distance of 150 yards, hug the northeastern shore as near as the wind in general allows, but in a vessel of heavy draft do not go inside the buoys on either side of the channel. The helm must be quickly and well attended to take advantage of the strong gusts and flaws.

When off the east end of the heights the breeze will be more steady, and the sail may then be reduced to enable her to take up a convenient berth among the numerous shipping. Should it be necessary to anchor in the narrows, give a good scope of cable, and shorten sail quickly to avoid dragging, as the wind rushes off the shore with great violence.

If the sea breeze hangs to the southward of east, the vessel will have to be warped in, and most probably to be kedged up the outer part of the channel. In this case, when coming from the eastward and having passed the Morro close aboard, stretch over to the Punta shore, and having tacked under it, shoot in as far as possible and anchor under the northern shore, waiting until the breeze slackens in the afternoon to warp up.

A good berth for a ship of war is in the northwest part of the harbor, just past the floating dock; the water here is cleaner. Unless the shipping is crowded, there is no necessity to moor; anchors bury themselves in the mud.

There will be no difficulty whatever in quitting the harbor, as the regular land wind is seldom interrupted except by Northers, which sometimes throw a heavy swell into the harbor's mouth. The best time to enter is about midday, and for quitting it, daylight.

CURRENTS.—Nothing is more uncertain than the point where the great Florida Stream is first met with. Sometimes it will be found 50 miles to the southwest of the Tortugas Islands. The vessel's position, by chronometer, should therefore be ascertained as frequently as possible. Under any

circumstances, it will be better to avoid the Cuba shore until the vessel is well to the eastward, when it may be necessary to sight the highlands in order to check the reckoning. In approaching the Cuba shore the easterly stream will seldom be met with until nearly on the meridian of Habana, or on the line between there and the Tortugas. It generally runs at the rate of from 2 to 3 knots close off the mouth of the harbor, and from thence in a northeast direction right across the Florida Strait.

It frequently happens that having arrived at a position south of the Tortugas without feeling the influence of the stream, it is perhaps entered soon after the reckoning has been checked in the evening, and in making the land on the following morning the vessel will be found far to windward of the port. The features of the land to eastward, however, differ so considerably from those to the westward that there will be no difficulty in making out the position. The land eastward of the Morro is about 200 feet high and rather flat, but about 18 miles to windward it rises into a remarkable ridge of irregular hills of moderate height, about 3 miles in length east and west, and a short distance from the shore, called the Jaruco or Iron Hills, while 18 miles westward of the Morro is the Mariel Tableland, and farther on in the same direction the Cabañas Hill.

Chorrera Harbor is 4 miles westward of the entrance to Habana, at the mouth of the Almendaraz River. It is quite open to the northward, and has no bar or other obstruction at its entrance. The anchorage in 3 to 5 fathoms would scarcely accommodate half a dozen vessels, and the holding ground is only coral sand.

TELEGRAPH CABLE.—At this place the end of one of the telegraph cables between Cuba and Key West is landed.

The rather low coast in the vicinity of the entrance to Chorrera is very ragged, the blackened coral rock being honeycombed by the sea.

WATER SUPPLY.

Until about 1591 the water supply of Habana was derived from wells and from such streams as the Luyano and the Almendares, which are several miles distant from the old intramural city. The so-called river Almendares, the larger of these two small streams, empties into the sea less than 4

miles west of the entrance to the harbor of Habana. It is fed chiefly by springs, and the water is reported by experts to be good. In 1566 a water course, or really a ditch, which is designated the Zanja, was begun for the purpose of furnishing a better supply of water by connecting the city with the Almendares River at a point called Husillo, about 5 miles distant. The water, after straining through filters, passes by an open ditch which runs close by El Príncipe to the ward called Colon, i. e., that portion of the city north of Calle de la Reina and west of the Prado.

The Zanja was not completed and extended into all parts of the city until 1591-1597. Pezuela states that its capacity is 70,000 cubic meters daily, but that, because of leakage and its application to the irrigation of intervening places, only 20,000 cubic meters reach the city. Throughout the most of its course the Zanja flows through unprotected mud banks; the fluids of many houses, especially in the Cerro ward, which it skirts, drain into them; men, horses, and dogs bathe in it; dead bodies have been seen floating in it, and in the rainy season the water becomes very muddy. In fine, the Zanja in its course receives all which a little brook traversing a village and having houses and back yards on its banks would receive. The water can not be pure, and to those who know the facts the idea of drinking it is repulsive. This supply had long been insufficient to the growing city, and in 1835 the well-protected and excellent aqueduct of Ferdinand VII. was completed.

AQUEDUCT OF FERDINAND VII.—This aqueduct taps the Almendares River a few hundred yards above filters mentioned, hence carried by arches to the east of El Cerro, and for some distance nearly parallel to the Calzada del Cerro, but finally intersecting this. The distributing mains pass in rear of the houses of the suburb to the city. Water supply inadequate; distribution general except for Colon ward.

The aqueduct is 7,500 meters long, has a pipe which measures only 18 inches, and receives also from the Almendares its water supply, which is inadequately filtered through pebbles and sand. The combined supply of the Zanja and of this aqueduct proving insufficient and unsatisfactory, the magnificent aqueduct of Isabel II., or of the Vento, was begun in 1859. Its supply is derived from the pure and inexhaustible Vento Springs, on the very edge of the Almendares

River, 9 miles distant from Habana. This aqueduct has already cost \$3,500,000, as is alleged, and will cost nearly as much more to complete. When completed it will furnish Habana with an ample supply of most excellent water. It has advanced beyond a point opposite to, and at no great distance from, where the aqueduct of Ferdinand VII. begins, and a temporary connection was established in 1878 between the two, so that this aqueduct now conveys to the city the clear, pure water of the Vento Springs and not the water of the Almendares. Thus a better, but no larger, supply is delivered through the small and very inadequate pipe of the aqueduct of Ferdinand VII. As results of these two supplies about 2,800 houses were in 1880 supplied from the Vento and about 2,450 houses by the Zanja from the Almendares. The remaining 11,000 to 12,000 houses are supplied from both sources, since their inhabitants buy it from street vendors, who procure it from the public fountains, of which the greater number are supplied from the Vento. There is little well or cistern water used. Only the suburban ward of Vedado is supplied exclusively in this way. This sparsely inhabited ward has about 1,500 population and the reputation of being very healthy.

All three of the water supplies to Habana—the Zanja and the two aqueducts of Ferdinand VII. and of the Vento—proceed from the Almendares and run their course near to each other, the farthest to the west being the Zanja and to the east the Vento.

At Vento Springs is constructed a large stone basin, open at the bottom, through which springs bubble. From this reservoir the new aqueduct leads. It is an elliptical tunnel of brick, placed under ground, and marked by turrets of brick and stone placed along its course.

From the Vento Reservoir the new aqueduct crosses the low valley south of Habana, following generally the Calzada de Vento, which becomes, near the Cerro, the Calzada de Palatino, to a point on the Western Railway marked 5 kilometers (about); hence the calzada and the aqueduct closely follow the railway for about a mile, terminating at a new reservoir to be placed (probably now finished) near the point where the Calzada Palatino turns 90 degrees to the southeast and about half a mile beyond the intersection of the Calzada del Cerro and Palatino, and nearly the same distance from a

hacienda called Las Delicias, near the Western Railway, west of Jesus del Monte. From this second reservoir distributing mains are to run down the Calzada del Cerro to the city. In 1890 El Cerro, though nearest of all parts of the city to the aqueduct, did not obtain its water from it. Here the people still bought their water. Probably now the supply of El Cerro comes from the new aqueduct. Vedado and Chorrera were, in 1890, supplied from the Almendares River by a reservoir placed on the hills near Paso de Madama, to which reservoir the water is pumped from the river.

It will be seen that the water supply of Habana could be readily cut off at two points—at or near Vento and the new aqueduct, southwest of Jesus del Monte, near line of Western Railroad.

SOIL, DRAINAGE, ETC.

The surface soil of Habana consists for the most part of a thin layer of red, yellow, or black earths. At varying depths beneath this, often not exceeding 1 or 2 feet, lie the solid rocks. These foundation rocks are, especially in the northern and more modern parts of the city toward the coast of the sea, but not that of the harbor, Quarternary, and especially Tertiary, formations, and are so permeable that liquids emptied into excavations are absorbed and disappear. In the southern and greater portion of the city these rocks are of Cretaceous formation, and so much less permeable that sinks and other excavations readily fill to overflowing. About 20,000 persons, or one-tenth of the population, live on land reclaimed from the sea, in large measure, by dumping on garbage and street refuse. Much of the reclaimed land was formerly mangrove swamps, and Habana still lies adjacent to these breeders of malarial poison. There are few if any towns in Cuba which are not subjected to malarial effluvia from mangrove or other swamps, and many of these suffer to greater extent than Habana.

The highest point within or adjacent to Habana is the summit of Jesus del Monte, 220 feet above the sea, but the number of inhabitants living even 100 feet above the sea is extremely small. In fact, not more than one-fourth of the population live over 50 feet above the sea, while at least 20,000 live on ground less than 7 feet, and 35,000 on ground from 7 to 13 feet above high tide. A heavy rain or a high tide with a north wind inundate the lowest floor of many houses in Habana.

In Cuban cities generally good drainage is never found except in such comparatively inextensive parts where nature requires little or no assistance. Even in Habana, the oldest and wealthiest city, the visitor is often astounded, especially in the rainy season, by impassable mudholes and green, slimy, stagnant pools in the streets and in the back yards. This condition is seen even in the Pueblo Nuevo ward, which is located so admirably for good drainage that little labor would be required to make it perfect.

Habana has no sewers save in a few principal streets. These sewers were built at interrupted intervals, and without reference to any general plan for drainage. They are seldom cleaned and are generally obstructed in part or wholly with sediment or filth from the streets, and exhale offensive odors. As the sewers are few in number, the greater part of the water of the city empties through the streets into the harbor or the sea, but the quantity flowing into the sea is comparatively small.

INHABITANTS.

Of the aboriginal inhabitants of Habana, none survived to see the seventeenth century. The present population may be divided into five classes:

1. Natives of Spain—"Peninsulares."
2. Cubans of Spanish descent—"Insulares."
3. Other white persons.
4. Persons wholly or in part of the African race.
5. Eastern Asiatics.

The number of white persons of other blood than Spanish is trifling, as is also the number of coolies or Asiatic laborers, imported from the Philippines. Thus reckoning the first three classes together and excluding the fifth entirely, there will be the usual division of whites of all classes and negroes of all degrees of white blood admixture, divided—70 per cent whites and 30 per cent negroes.

The ratio of the races in the city of Washington according to the census of 1890 was 67 per cent whites and 33 per cent negroes. Hence it will be seen that the negro element is more numerous in the capital of our own country than it is in the capital of Cuba.

The character of the inhabitants is described as emotional and sombre, with a disposition to despondency. Adding to

this tendency their native physical laziness, they seem to be habitually inert and opposed to exertion for the sake of the future. A native—a “mañana”—as we know him to be, may talk much and indeed brilliantly of what may or ought to be done in every circumstance of life, from the framing of the law to the making of a salad, yet he does nothing.

A noted traveler in referring to the character of the Cuban natives, says: “These people are indolent, vain, and untrustworthy, the men unreliable in business, venal in public life, and selfish in private relations; but they are as a rule kind hearted and hospitable, quick tempered and dangerous when aroused, yet with but little steady courage; and in spite of their readiness to fight, make but indifferent soldiers, since they lack the persistent courage necessary to withstand a reverse or redeem a defeat.”

The above does not refer to that large portion of desirable Cuban emigrants who come from the northern provinces of Spain. These men are the Yankees of the Antilles, hard-working, practical, frugal, and successful wherever they plant themselves. They are reliable in business life, faithful and honest in private relations, and make perhaps as good soldiers now as in the days when Spanish infantry was the scourge of every battlefield of Europe.

DEFENSES OF HABANA.

(63)

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DEFENSES OF HABANA.

HISTORICAL SKETCH.

In 1538 the city of Habana was laid in ashes by a French privateer. In order to prevent the recurrence of such a disaster, the governor, the celebrated Fernando de Soto, erected the Castillo de la Fuerza to defend the entrance to the harbor. But the precaution was insufficient, for in 1554 the French again took and destroyed Habana. Two other fortresses were then added.

El Morro was commenced in 1589, finished in 1597, but additions have frequently been made since that time. It was partly destroyed by the English in 1762, rebuilt shortly afterwards, and since continually improved.

La Punta, a much smaller fort, was commenced in 1589.

In January, 1762, hostilities were declared, and during the summer Lord Albemarle, with a fleet of 200 sail in all, and a land force of 14,041 men, attacked Habana. The defense, made by an army of 27,610, was most obstinate, and lasted two months. The city capitulated August 13, constant firing having gone on between the captured Morro, the siege batteries, and the Spanish works in the town. The capture of Morro itself can, however, be said to have sealed the city's fate.

Soon after the restoration of Cuba to Spain, Count de Ricla, otherwise known as Count of Santa Clara, was appointed governor, and took an ardent interest in Habana's military defenses.

Most of the present fortifications were originated by him, and the Bateria de Santa Clara was named in his honor.

During the years from 1726 to 1796 a great navy yard grew up on the bay of Habana, and 114 war vessels were built there to convoy the Spanish treasure ships. But this was closed in 1796.

At the time of the trouble between Germany and Spain over the Caroline Islands in 1885, the state of the fortifications was considered so bad that a popular subscription was made by the citizens of Habana for the improvement of the defenses. It amounted to \$200,000, and it seems to have been largely misappropriated, though some was used in the reconstruction of the battery of Santa Clara, and extending eastward of the sea front of the Morro. Within the last couple of years there existed and still exists a great activity in building new fortifications and erecting earthworks.

THE FORTIFICATIONS OF HABANA.

There are now fifteen fortifications in and about the city of Habana, more or less armed and garrisoned, besides a work partly constructed and not armed, called Las Ánimas, and the old bastions along the sea wall of the harbor. These works are as follows:

Nos. 1 and 2 are earthen redans on the seacoast, east of Habana.

Velazo Battery, just east of, and a part of El Morro.

El Morro, a seacoast fort, with flanking barbette batteries, east of harbor entrance.

The Twelve Apostles, a water battery lying at the foot of Morro, with a field of fire across the harbor's mouth. It is a part of Morro.

La Cabaña, a stone bastioned work with both land and water front, in rear of El Morro, and directly opposite the city of Habana.

San Diego, a stone bastioned work with only land fronts, east of Cabaña.

Atarés, a stone bastioned work on hill at southwestern extremity of Habana Bay, near the old shipyard called the arsenal.

San Salvador de la Punta, a stone bastioned work west of harbor entrance, with small advanced and detached work, built on a rock near harbor mouth.

La Reina, a stone work, in shape the segment of a circle, placed on the seacoast, at western limits of city, on an inlet called San Lázaro.

Santa Clara, a small but powerful seacoast battery of stone and earth, placed about $1\frac{1}{2}$ miles west of harbor.

El Príncipe, a stone bastioned redoubt west of Habana.

Nos. 3 A, 3 B, and 4, are earthen redans on the seacoast west of Habana.

There are, in addition, several works built for defense, but now used for other purposes or abandoned. These are:

The Torreón de Vigía, a Martello tower placed on the inlet of San Lázaro opposite La Reina.

The old fort called La Fuerza, built three hundred and fifty years ago, near the present Plaza de Armas, and now used for barracks and public offices.

The work called San Nazario, situated north of El Príncipe, but now used in connection with the present cartridge factory, abandoned for defensive purposes.

The work called La Pastoria, lying about 500 yards south of Morro, on east side of the bay, and nearly under the walls of Cabañas. Its field of fire was across the bay, the city, and towards the northwest; it is useless, and probably will never be restored. It is now used merely as a store-house.

The partially constructed fort called Las Ánimas, south-east of Príncipe, lying on a low hill, partly built but useless and unarmed.

The old sea wall extending from near La Punta to the Plaza de armas, unarmed, and useless except as a parapet for musketry.

The old arsenal, on the west of the inner bay, now used as repair works for ships, useless for defense.

The old artillery and engineer storehouses near La Punta, probably once used as strongholds, now mere storehouses for munitions of war.

There are besides, in the vicinity of Habana, three old and now useless stone works—one at Chorrera, the mouth of the Almendares River, about 4 miles from Habana harbor; another at Cojimar, on the coast, about 3 miles eastward of Cabaña, and the third at the inlet called La Playa de Marianao, about 7 miles west of Habana.

The number of submarine mines amounts to 198.

A military telegraph line, constructed in 1885, between all the forts and the office of the governor general, as well as the military hospital of Habana, has now been extended to the newly erected fortifications.

SEASHORE DEFENSES.

BATTERY NO. 1.

It is a seacoast battery, built of earth, of recent construction and equipment. It is a simple redan; guns mounted in barbette, earth traverses between the guns, and powder magazines under the traverses.

COMMAND.

Sea. It is situated 60 feet above sea level.

ARMAMENT.

Four Hontoria 6-inch guns.

Two Nordenfeldt 6-pounder, R. F.

Four 8-inch Howitzers, curved fire.

GARRISON.

Small. Exact figures unknown.

BATTERY NO. 2.

It is also a seacoast battery, and also, like the battery No. 1, a simple redan, built of earth, of recent construction and equipment. Guns are mounted en barbette, earth traverses between the guns, and powder magazine under the traverses.

COMMAND.

Sea. Its altitude is a little over 60 feet.

ARMAMENT.

Two Krupp 12-inch guns.

Four Hontoria 8.3-inch guns.

GARRISON.

Small. Exact figures unknown.

VELAZO BATTERY.

Forming part of El Morro, though separated from the old work by a wide ditch cut through rock almost to the ocean's level, is an earthwork, open to the rear, and following the general crest of the cliffs, which gives it a command of probably 150 feet. It consists of a low parapet of earth, about 4½ feet high and 8 or 10 feet thick, over which guns fire en barbette, guns separated by traverses. The work is open to the rear and has its right flank open. It would be difficult to hit

from the sea, as it lies low along the ridge of the cliff, perhaps 150 feet high, and nearly perpendicular. It could be best taken by fire of field guns and infantry, from the hill of San Diego or other hills southeast and south of Habana or by infantry attack from the rear. The guns in this work are separated by earth traverses. The road along the north coast lies between this and Cabaña. The work is incomplete, is unclosed, and exposed on the right flank and rear; the left flank rests against the Morro ditch.

COMMAND.

About 150 feet.

ARMAMENT.

Four Krupp 11-inch guns.

Two Ordoñez 12-inch guns.

GARRISON.

Small. Comprised in that of El Morro.

EL MORRO.

The Morro, or Castillo, is the most frequently mentioned and best known of Habana's fortifications. It is situated on a projecting point of the eastern side of the harbor entrance.

The Spanish description reads:

"Northeast of the Bay of Habana, situated on a larger rock which serves as its base, is El Morro. It is surrounded by a very deep ditch or waterway, open to the same rock, and by a road covered with a battery which looks to the sea, known as the battery of the Pena. Below the precincts at the base line of the castle, appear the grand batteries called the Twelve Apostles, which contain an equal number of pieces of large caliber looking toward the entrance of the port. Crowning its batteries are sixty pieces of all calibers, some rifled, the others like those in the batteries of the Twelve Apostles below."

At the seaward corner stands the famous Morro lighthouse O'Donnell. Its armament is well described in the foregoing quotation, but it should perhaps be said that the guns of the Apostle battery referred to are of the largest caliber on the island.

El Morro was commenced in 1589 and finished in 1597. It was partly destroyed by the English in 1762 and rebuilt shortly afterwards. It lies directly north of the city, at the extreme

point of the east shore of the bay. It is the first part of Habana seen on approaching from the sea. The old castle is a stone bastioned work, placed on a steep cliff of considerable height. It is useless as a defensive work against sea attack; in its present condition the parapets and bastions are exposed and without earth covers of importance.

By common report El Morro is now said to be used simply as a prison. Within are placed the lighthouse and signal station for ships. The Morro is reached by a ramp, or covered way, cut through the solid rock from the rear. One face of the old work looks eastward along the road from Cojimar.

According to a rumor, the weakest spot in its walls is directly under where the search light is.

It is said that during recent years the officials have been afraid to fire the larger guns to any great extent for fear of the possible effects on some of the walls.

COMMAND.

Sixty-six feet above datum.

ARMAMENT.

Four Krupp 6-inch guns.

Twelve old 10-inch guns.

Eight old 8-inch guns.

Fourteen old 6-inch guns.

GARRISON.

One thousand two hundred men, but it can contain double or triple such number. The rank of its ordinary commanding officer is major of infantry.

NOTES.—SUNKEN MASKED BATTERIES.

Much as the Spanish engineering has been condemned, great ingenuity has been displayed in the construction of this formidable and dangerous character of fortification. Closely underlying much of the soil in the vicinity of Habana is *cocina* (coral rock), which is easily excavated, and which is said to withstand fire better than any other kind of rock, as it will not splinter or fly. Trenches are cut into it, and from short distances nothing is seen to indicate the existence or extent of defensive works, care being taken to mask the guns.

The extensive new works east of the Morro, while generally composed of earthen ramparts, to a certain extent have this sunken feature.

MORRO WATER BATTERY.

Called the Twelve Apostles. Lies at the foot of Morro at harbor entrance; it faces approximately west. It is a stone, or rubble and cement, water battery. It is small, lying close against the cliff; it could be best destroyed from the sea, but would of course fall with the Morro. There are no earth covers. The work rises sheer from the water. One heavy shell striking it, or above it, would probably destroy the whole place. Guns are mounted en barbette, placed close together without traverses intervening.

COMMAND.

It has a command of about 20 feet, and it has a field of fire from northwest to southeast—that is, from seaward westward by the coast, city, and up the channel toward the harbor. The long-range fire is limited in field, but the battery sweeps the shore and gulf toward Vedado and Chorrera and is advantageously situated to repel an advance from that direction.

ARMAMENT.

Authorities differ as to the armament of this battery, but it probably consists of six old 10-inch guns; the Spaniards, however, intended to place here their largest caliber guns.

GARRISON.

Varying. Comprised in that of El Morro.

CABAÑA.

Commenced in 1763, finished about 1774. Cost, approximately, \$14,000,000. Now worthless as a fortification.

Comprising the annexes, ditches, and approaches, its length (north to south) is 1,900 yards, and its width (east to west), 280 yards. Its harbor frontage is fully 75 feet above the sea level, crowning an exceedingly abrupt bluff of rock rising almost from the water's edge. On this side is practically a continuous wall, with a few lightly defined angles. There are three prominent bastions on the landward side.

Cabaña lies some 500 yards southeast of El Morro, on the east side of Habana Bay. Toward the city it exposes a vertical stone wall of irregular trace, with salients at intervals. Toward the Morro is a bastioned face protected by a deep ditch, sally port, and drawbridge.

The average thickness of the walls is about 5 feet, but there are said to be several points exposed to fire that are exceedingly weak.

Eastward and southward a beautifully constructed land front incloses the work. This front is protected by ditches 40 or more feet deep, well constructed glacis, stone scarp, and counterscarp. Cabaña is a magnificent example of the permanent fortifications constructed a century ago. Probably 10,000 men could be quartered in it.

The entrance to Cabaña is by the sally port that opens upon the bridge across the moat lying between Cabaña and El Morro. Upon entering, the enormous extent of the work begins to be perceived, parapet within parapet, galleries, casemates, and terrepleins almost innumerable, all of stone and useless. There are no earth covers or traverses, and no protection against modern artillery.

Cabaña is now used chiefly as a place of retention for state prisoners of importance.

Cabaña could be silenced or destroyed by small guns on hills near Guanabacoa and Jesús del Monte.

COMMAND.

The command of Cabaña is lower than that of the Morro. Southwest, west, and northwest it overlooks harbor and city; northward it has a small field of fire seaward past the Morro. Northeast, east, and southeast the land front sweeps the approaches from Cojimar, the hills, and low ground toward Regla. On the east Cabaña has a glacis, and is in part protected by earth. Is 157 feet above sea level at foot of glacis. As a defense against attack from this quarter, and against light guns, the land face might have some value, otherwise the work, both by its construction and location, is useless. It lies within a thousand yards of the heart of Habana, about 1,400 meters from Tacón Theater. Though capable of being strengthened by earth covers in parts, and though to the north and northeast the work is covered from the fire of ships lying off the coast near Cojimar, and to some extent near Chorrera, the work has little defense value.

ARMAMENT.

Cabaña is said to have the following guns: eight old 8-inch, three old 6-inch.

One authority reports only a saluting battery and five small land-defense guns.

GARRISON.

Cabaña is governed by a brigadier general, and has a garrison of some 1,270 men.

NOTES.

The traditions and rumors as regards secret passages and underground connections with other fortifications are particularly numerous in connection with these works, and unquestionably some of these exist.

The extensive system of sunken passages, well protected against fire from either sea or land, connects El Morro and Cabaña.

One is well known to exist at the top of the rocky ridge connecting the water batteries which are stretched in front of the main fortifications at a much lower level. In fact these batteries extend so as to nearly meet each other, and along their front is piled old round shot and similar material.

MORRO-CABAÑA SECRET PASSAGE.

From an exterior or salient corner of the secretary's office of the headquarters (see Cabaña map) there leads a subterranean passage 326 meters long, 2.5 meters wide, and 1.86 high excavated in the rock. It conducts to the sea, debouching at the mouth of a sewer, 87 meters from the Morro wharf. At exactly 132 meters along the road rising from the Morro pier or wharf to the Cabaña, there will be found by excavating the rock on the left of the road, at a depth of 3 meters, a grating, on opening which passage will be made into a road 107 meters long, 1.6 high, and 1.42 wide, leading to the same exit as the Cabaña secret way. These passages are *most secret*, as all believe that the grating of the sewer, seen from the sea, is a drain.

SEA WALL.

Lying about 500 yards from La Punta, and near the shore, is a small bastion which marks the northern point of the old wall of Habana, now removed; it is used as a kind of barrack and ordnance storehouse, and from it the old sea wall extends to the old fort La Fuerza. For a hundred yards or more this is built with a stone parapet for guns and troops; no guns are now mounted here. The sea wall was built for defense; it is about 12 to 15 feet above water level, has a bastion here and there, and a parapet for small guns and

infantry in many places, but is now useless except as a possible shelter for riflemen. Along the wall, and near La Fuerza, lie old and worthless guns, iron carriages, and ordnance material, all practically worthless. A soldier of the Orden Público is usually on duty here, and the headquarters of this corps are near by. The sea parapet ends near La Fuerza, and the west and north bay shore is undefended as far as the old arsenal, now useless for the purpose, and so to Atarés.

LA PUNTA.

San Salvador de la Punta, commenced in 1589, is placed at the western entrance to Habana Bay. It is composed of two parts—a small bastion on shore (at the present outlet of the city sewer), and a small redan in front surrounded by water. La Punta lies hardly above the level of the sea and near the heart of the city. Close by it are the prisons, and the artillery and engineer storehouses.

Both by location and construction La Punta has little value as a defensive work ; but it is small and would be difficult to reach from the sea.

It is situated on a point jutting out at the northeast corner of the city, and is closely adjacent to an important built-up portion of the same.

La Punta is of limestone, with walls 8 or 10 feet thick ; the bastion extends beyond the shore line, and the covering redan lies some yards beyond on a small rock west of the harbor entrance. The parapet is of stone about 6 feet thick. The guns are but slightly protected, as there are no covers or traverses of earth. No casemates are visible and guns fire en barbette with a command of about 12 feet above the sea. There is little possibility of strengthening the work with earth, as it lies at the water's edge.

COMMAND.

The possible field of fire is hardly more than 90 degrees, *i. e.*, from north to west (except across the harbor to the hill of the Morro and Cabaña, half a mile across). The hill of Morro, Cabaña, and the city shut in the remainder of the field of fire. The work is dangerous to direct approach to the harbor from the sea, and commands also the shore west, the road, and railroad to Chorrera.

La Punta is commanded by the Morro and by Cabaña ; it is much lower than either, and could be made untenable by musketry placed on the eastern shore of Habana Bay.

ARMAMENT.

Three 6-inch guns.

Six 4-inch old bronze guns.

One 9.5-inch old cast-iron Armstrong gun.

Two mortars of no use, dismantled.

The muzzle-loading guns have a store of ammunition of 300 rounds each.

It is to be noted that the Armstrong gun which, on account of being old, should have spherical projectiles, is provided with cylindrical ones, and in target practice in 1885, the projectiles after leaving the gun, instead of revolving around in the direction of their axis, revolved around a perpendicular axis, from which it may be inferred that it is not possible to train this old gun.

GARRISON.

Two companies of recently arrived artillery. The ordinary commander ranks as a major of infantry.

BATTERY LA REINA.

La Reina stands on the north coast on the cove of San Lázaro, and opposite the old Martello tower of Vigía, the landing place of one end of the northern cable. Near by are the Hospital of San Lázaro, the Leper Hospital, and the Foundling Asylum.

La Reina, in shape the segment of a circle, is a casemated work of soft stone, which if shelled would crumble rather than splinter, without face covers; it stands directly on the shore. The sea face, a circular, vertical wall of stone, is pierced by embrasures; the land face, also vertical, is loop-holed for musketry, and has a few small embrasures.

As it lies close to the water's edge it could not well be protected by earth, which is very scant in the vicinity.

The work may have a slight value as protecting from boat attack the cable landing at Torreón de Vigía opposite.

It is used as a prison for important state offenders. Here Prado was confined during the trouble about the frauds committed in January, 1890, known as the Orteiz case.

The low drawbridges have now been closed, and the shore line banked with sand, thus forming a parapet about 35 feet in height.

COMMAND.

The walls rise about 20 feet from the low shore, which is not more than a foot or two above the sea. The greatest command of the work is perhaps 30 feet above the sea. Over the casemates on the sea face is placed a parapet of earth, 10 or 12 feet thick and perhaps 6 feet deep.

La Reina gives fire seaward and along the coast east and west, and might be of use in resisting an advance from Chorrera.

ARMAMENT.

Mounted en barbette over the casemates are the following guns:

Eight 6-inch Parrotts (old).

Three 6-inch Armstrongs.

Two 4-inch Ordoñez; to be mounted.

Nine 3.75-inch Krupps; to be mounted.

GARRISON.

It is garrisoned by a small force, though intended for a guard of 250 men. The rank of its ordinary commander is captain of artillery. Recently it was used as the general headquarters, but it is believed that they will be moved to Santa Clara.

NOTE.

Opposite La Reina is placed the Martello tower, called La Vigía or San Lázaro. It was built in 1556, and is now useless for defense, and is simply of importance as locating the end of the Key West cables. It is protected by the fire of Santa Clara.

BATTERY OF SANTA CLARA.

Finished in 1797. The most westerly of the fortifications of Habana proper, and placed on the north coast, about 1½ miles from the harbor mouth. It is one of the most important works of Habana.

The Santa Clara battery lies about 100 yards from the shore of the gulf, at a point where the line of hills to the westward runs back (either naturally or artificially) into quarries, thus occupying a low salient, backed by a hill in rear with a command above the sea of about 44 feet. The work is partly built in the natural rock, a soft limestone, with walls partly of this rock, partly of loose stones and cement called "mampostería."

To the right and extending backward is a quarry from which so much stone has been taken that in the rear of Santa Clara, from the hill above to the bottom of the quarry (near which passes the continuation of the Calzada de la Infanta), the height is about 50 feet; to the left lies another deep quarry. The shore in front of Santa Clara is low and rocky. In the rear the hill continues to rise; it is uncultivated, covered with brush and weeds, *diente de perro* (a sharp stone formation springing through the surface of the ground). A road runs back from this hill to the old work called San Nazario (now a cartridge factory). Near Santa Clara is the great charity hospital. Telegraph or telephone wires run toward El Príncipe.

The rear face of Santa Clara (*i. e.*, toward the hills) is surrounded by a loopholed wall some 8 feet high. No guns can be mounted here. This wall runs along the hill, approaching within 15 or 20 feet of the steep quarry wall. The quarries on either side are absolute dead spaces so far as this work is concerned, and being on a level with the roads, form excellent places for troops to await an attack from the sea, or from the direction of either Chorrera or Habana. Toward Chorrera, and facing the road, railroad, and seacoast, extends one face of the work, composed of a parapet in part of earth, probably 10 feet thick and faced with stone. In front of this is a little unimportant ditch. This face is also in part protected by the hill in front, down which the road runs from the Calzada below. Connected with this face is that facing seaward and commanding the approach westward along the shore.

The hospitals for contagious diseases are placed elsewhere, the leper hospital near the punta, or at least along the railroad track and not far away, and for smallpox patients the pest houses across the Almendares River.

The parapet of the sea front of Santa Clara is about 10 feet thick; it has been recently built, and is constructed partly of natural rock and partly of a mixture of loose stones and mortar.

The magazines are in the light earthen traverse of the work. The trace of Santa Clara is very irregular; the work is small and can shelter only a small force. One heavy shell reaching it from the sea would probably destroy it, but the low inconspicuous work would be exceedingly difficult to hit from the

sea, or indeed from any point likely to fall into an enemy's hands. It could best be captured from the hill in rear and by infantry attack. Around Santa Clara there is no ditch except the small short one mentioned. Its wall is laid close to the nearly perpendicular hillside in rear, cut away to the calzada and shore below. Next to El Principe and El Morro, Santa Clara is, on account of its armament, perhaps the most important work about Habana.

The wall of the fort is 6 feet thick at the bottom, 4 at the top, and high enough to conceal the guns' crews. Sand is piled in front of this wall to the crest of the stone, and slanting down at an angle of 10 degrees. On this is placed a layer of T railroad iron, and on to the wall and over that a foot or less of sand. The Spaniards believe that shot striking the face of the fort will, on reaching the railroad iron, glance off and pass over the heads of the gunners' garrison.

It is reported that the magazine is situated slightly west of the center line, across the front of the works.

The covering of the soil near Santa Clara is so thin that earthworks could be erected with difficulty. It is said that the soft limestone rock of which most of these works, as well as most of the buildings of Habana, are constructed crumbles into dirt under impact.

COMMAND.

Its fire is along the coast east and west and seaward across the approach to the harbor. The battery of Santa Clara is useless if it has to fire to the northeast, as in that case shots from this battery will be likely to hit Morro Castle itself.

By the form of the work it is intended solely as a defense against sea attack; but as the ground at its rear is higher, and is thoroughly commanded by works situated on a higher elevation, therefore attention should be called to certain physical features of the surrounding ground.

A little to the eastward of Santa Clara Battery is the point of a range of hills reaching nearly to the water front, which range runs first in a southeasterly direction, thence continuing in a southwesterly direction, continuing in practically a semicircle, extending around the harbor at varying distances therefrom until it connects with a ridge along the seacoast running eastward from the Morro. True, it is broken at places, and varies greatly in height at different points, yet in the main the general statement concerning it is correct, and

the topographical features which it presents are of great importance on the question of Habana's defenses. At the point mentioned as its commencement it practically divides old Habana from its wealthiest and most recently-built suburb, El Cannelo el Vedado, or, as it is ordinarily called, the Vedado. This section, running along the open sea front from Santa Clara to the Boca del Río la Chorrera, is principally occupied by dwellings of the rich, surrounded by the richest gardens and similar embellishments of the tropics, and is traversed by a steam dummy line. The city terminal is about 200 feet east of the Batería de la Punta, the other at the Boca del Río la Chorrera. But one highway from the city proper runs through the Vedado, this being the Calzada de Vedado. This is a wide street, partially improved. The Vedado proper is only a few feet above the sea level. The side of the ridge referred to begins to rise almost from the south side of the dummy line, and while not precipitous, it does rise quite rapidly, so that from its commencement until it reaches the vicinity of the cemetery only two or three steep, crooked, unimproved roads cross or reach the top of the ridge.

All along the Vedado and the northerly side of the ridge are sunken masked batteries, cut directly into the soft Cocina rock, which lies close to the surface.

As already stated, the ridge is somewhat irregular, both as to height and general form, but it should be understood that the raised ground thoroughly commands the Vedado on one side and the city proper, with the approaches thereto, around the harbor, on the other.

ARMAMENT.

Three 11-inch Krupps (new).

Two 12-inch Ordoñez (new).

Eight 8-inch Howitzers.

Four Howitzers (old) Elorsa.

Six 4-inch, old bronze (not mounted).

Two 6-pounders, Nordenfeldt R. F.

No guns mounted before January 1, 1898, had disappearing carriages. The carriages rest on beds of concrete of inadequate thickness and bad quality. No cranes or other machinery for hoisting shot or powder to even the largest guns were on hand at the beginning of this year.

It is said that owing to the weakness of the original foundations for the modern guns, it was considered unsafe to fire them. However, new foundations have doubtless been constructed.

The supply of ammunition consists of : 200 rounds for each 12-inch gun, 500 rounds for each 11-inch gun, 1,000 rounds for each of the remainder, in 3 separate chambers.

GARRISON.

One company of infantry and one platoon of artillery. Its ordinary commander ranks as captain of artillery.

NOTE.

There are some sunken masked batteries in the vicinity.

BATTERY NO. 3 A.

It is a shore battery, situated on the seacoast between Santa Clara and Chorrera, and the railroad from Habana to Chorrera passes just in the rear of it.

It is built of earth, of recent construction and equipment. Its type is that of a simple redan, guns mounted en barbette, earth traverses between the guns, and powder magazines under the traverses.

COMMAND.

It is less than 20 feet above the sea level.

ARMAMENT.

Four 8.25-inch Howitzers, Ordoñez.

Four 8-inch Howitzers.

Ammunition, 1,000 rounds.

GARRISON

Force unknown. Estimated to be small.

BATTERY NO. 3 B.

It is another shore battery, situated on the seacoast between Santa Clara and Chorrera, not far westward from the Battery No. 3 A.

It is also of a simple redan type, built of earth, and of recent construction and equipment. Guns mounted en barbette, earth traverses between the guns, and powder magazines under the traverses.

The railroad from Chorrera to Habana passes in the rear of the battery.

COMMAND.

The battery is 20 feet above the sea level.

Two 9.5-inch Ordoñez, new.

Two 6-inch Ordoñez, new.

Four 3-inch Howitzers.

GARRISON.

Small. Exact force unknown.

BATTERY NO. 4.

This is the most western shore battery on the seacoast between Santa Clara and Chorrera, not far westward from the Battery No. 3 B, and like the latter, of simple redan type, built of earth, and of recent construction and equipment; guns mounted en barbette, earth traverses between the guns, and powder magazines under the traverses.

Habana-Chorrera railroad line passes in the rear.

COMMAND.

The battery is 23 feet above the sea level.

ARMAMENT.

Three 6-inch Hontoria.

Four 6-inch Krupp.

Four 6-inch Ordoñez, new.

Two 6-pounders, R. F., Nordenfeldt.

Two 2-inch, R. F.

On either side excavations for nine more 3.75-inch Krupp guns are being made. These are the ones which were formerly in the Mariel-Majana Trocha.

GARRISON.

About 150 men, commanded by a captain of infantry.

HARBOR AND CITY DEFENSES.

The following fortifications were built for the defense of the harbor and the city, but their field of fire includes, in a limited way, parts of the seashore also.

SAN DIEGO, OR NO. 4.

Finished about 1775. The most easterly of the old works of Habana, occupying the hill east of Cabaña, about a thousand yards distant. The ground slopes gradually from Cabaña and from coast, but precipitous toward south and east.

San Diego is of masonry—soft limestone—very irregular in trace, following to some extent the outlines of the hill on which it is placed.

Situated 2,100 yards south of the Morro and 1,200 from Cabaña, whose fire protects it, covering its flanks. It has excellent barbette batteries, vaulted quarters, wells and cisterns for water, and buildings for a protracted defense.

It is a barbette battery, facing practically eastward, and designed to protect the rear of the Cabaña. It has probably been recently strengthened with earthworks, mounting some modern guns of small caliber, as a protection against land attacks.

It is in general surrounded by a small ditch, probably 8 feet across and shallow, largely now filled with vegetation. The walls are about 8 feet thick and cut by embrasures intended for guns placed on the terreplein. The hill on which it lies is somewhat stony and uncultivated; a path or road leads from the work to Casa Blanca, and another to Cabaña and El Morro, over a somewhat brushy country, but one easily crossed by foot troops. Between San Diego and Cabaña are two powder houses built of stone and surrounded by stone walls. Guards are kept here. There are no military works between San Diego and Cabaña except the powder houses.

COMMAND.

This fort is 190 feet above the level of the sea.

Eastward, San Diego commands the ground in the direction of Guanabacoa, some 2 miles away, low ground intervening. Hills about Guanabacoa (especially La Loma de la Cruz) rise above the fort. Eastward and southward the hill on which San Diego stands is precipitous; north and west lies the generally even surface of Cabaña Hill, with no obstacles intervening. It has a field of fire around the bay to Regla; to the northeast and north, upon the gulf.

By strengthening with earth covers, for which there is sufficient soil at hand, it could be made into a formidable work, but its effective field of fire would be limited to the arc

of a circle drawn from Morro eastward by Cojimar (but here to some extent cut off by the hills, though commanding probably small parts of the road from Cojimar), thence by Guanabacoa to Jesús del Monte, and as far toward the city of Habana as the hills near Casa Blanca will permit.

From San Diego to Cabaña a line of parapets of earth might readily be thrown up which would make this point exceedingly strong against an advance from Cojimar. South of the range of hills the valley is too low to make this possible.

ARMAMENT.

Four 6-inch Hontoria, new.

Two 6-pounder, R. F., Nordenfeldt.

It is expected that twenty more modern guns will be mounted.

GARRISON.

San Diego has a capacity for a guard of one hundred or more men. The rank of its ordinary commander is captain of infantry.

NOTES.

As in Cabaña, the ditches are given to peaceful uses; huts are found; animals graze over the grass-grown slopes and decaying walls.

ATARÉS.

Atarés occupies the round hill at the head of the harbor at southwest of Habana Bay; built 1763 to 1767. It is a small bastioned stonework, but it would be difficult to capture by assault if well defended, for it occupies the summit of a solitary conical hill, whose smooth faces permit of fire on all sides. A road runs up from the side toward the station. There seems to be plenty of soil on this hill by which the stonework could be protected. In the vicinity of the station, and for several hundred yards in either direction, the road is a sort of paved causeway, raised above low ground on either side, which would be impassable for wagons and artillery; it is about the width of four wagon tracks, muddy in places, and, though partly paved, probably becomes bad in wet weather.

This work is not intended to protect the head of the harbors, but more especially to oppose the advance of land forces to the city proper through the low lands between it and the Principe. This last fact is emphasized by the frontage of the auxiliary batteries,

In form it is a double or triple-tiered bastioned fort of irregular shape, approaching a circle, but with nearly a dozen angles, none of which, however, are far-projecting or prominent.

The eastern, western, and southern sides have an outlying earthen lunette in front of them, which front a little west of south, while a deep ditch surrounds most of it.

COMMAND.

Atarés crowns the hill which dominates the inner bay, the low ground south and southwest of Habana, the east shore of bay, Cristina Station, the Western Railway for about 2 miles, the Marianao Railway, and, in part, the Calzada from Jesús del Monte.

Atarés is useless against sea attack, and nearly so against land attack. It would only be troublesome as commanding the Western Railway for about a mile southward, perhaps the station at Regla, a short portion of the Bay Road, of the Marianao Road, and might be annoying in a flank march from Guanabacoa; but even field guns here would answer these purposes.

Atarés is 111 feet above sea level, but is itself commanded by many of the hills around Habana.

ARMAMENT.

Two Krupp guns, 12 centimeters (4.7 inches), and one rapid-fire gun of 57 millimeters (2.3 inches), Nordenfeldt. Also reported to be three 8-inch Barrios rifles on harbor side, ten 4 or 5 inch old bronze guns, and two old 12-inch mortars, land side.

GARRISON.

The fort is not considered as important as some of the others, for ordinarily its ranking officer is only a first lieutenant of infantry.

The garrison generally consists of 90 men, divided between artillery and infantry.

For some act, a century or more ago, on the part of its garrison, it is the only Habana fortification that is permitted to fly a silken flag.

NOTE.

In Atarés there has been placed a series of torpedoes,

EL PRÍNCIPE.

Is also called Castillo del Príncipe (Fort of the Prince). This is one of the most important fortifications about Habana, and, while of somewhat later construction than those described, it is, however, of ancient date and similar to them in general character. Work on it was begun in 1774 and completed in 1794.

El Príncipe is one of a line of works designed to protect the land side of Habana. Atarés is another. A third, Las Ánimas, was designed and partly built to protect the low ground lying between the Cerro and Jesús del Monte.

The main work of El Príncipe is an irregularly shaped bastioned fort, constructed of stone, probably carbonate of lime, as are most of the works here, surrounded by an extensive mote, with five prominent angles pointing respectively northwest, northeast, and southwest. It has five bastions, whose salients are very acute and could be easily destroyed by shells. The curtain connecting the two bastions facing the sea is covered by a redan, as also is the curtain connecting the two bastions facing about northwest toward Chorrera. On the Habana side, toward Atarés and the bay, are two bastions meeting at a reentrant with no curtain proper. About the same condition is shown on the face fronting the Habana railroad entering from La Ciénaga. The scarp walls of Príncipe are some 40 feet above the bottom of the ditch, which is perhaps 50 feet wide, the counterscarp 20 feet high. In other words, about 20 feet of parapet is exposed above the surface of the hill. The parapet, through which embrasures are cut on all sides for guns, is perhaps 8 to 10 feet of stone. There is no earth cover. The ditches are dry, and along the counterscarp are places of arms.

It is situated 2,100 yards to the west of The Plaza. It has arched lodgings for a numerous garrison, stores, cisterns, and other essentials for a protracted defense.

The importance attached to this fort is shown by the fact that its ordinary commander is a brigadier general.

In its present state Príncipe is of little value, but it could easily be made into a powerful sunken work by removing the top portion. Resting as it does on the summit of a hill, the lower portion is completely protected by earth, of which there is an abundance.

It is believed also that additional earthworks have recently been constructed closely adjacent to this fort.

COMMAND.

Príncipe is 187 feet above sea level and completely dominates Habana, the bay, Morro, Cabaña, the coast northward, Atarés, and from east around to south, the approaches of the Marianao Road, Cristina, and the Western Railroad for about 3 kilometers, *i. e.*, between Cristina and a cut at that distance from the station. Príncipe gives fire upon Tulipán, the Cerro, the Hill of the Jesuits, and the valley through which passes the Habana Railroad, sweeping completely with its guns the railroad as far as the cut at Ciénaga, $2\frac{1}{2}$ to 3 miles away. It dominates also the hills southward and westward toward Puentes Grandes and the Almendares River, and country extending toward Marianao; also the calzada leading to the cemetery and toward Chorrera; thence the entire sea line (the railroad to Chorrera is partly sheltered by the slope leading to Príncipe). This is by all means the strongest position about Habana which is occupied. Lying between it and the hill of the Cerro is the hill of the Catalán Club, right under the guns of the work and about one-half mile away. The Marianao Road is more sheltered than the Habana, as it runs near the trees and hill near the Cerro. The only points which dominate the hill of the Príncipe lie to the south and south-east, in the direction of Jesús del Monte and beyond Regla. On its southern, southeastern, and southwestern faces the hill of Príncipe is a steep descent to the calzada and streets below. The slope is gradual westward and around by the north. From this hill is one of the best views of Habana and the valley south.

El Príncipe lies about one-half mile from the north coast, from which hills rise in gradual slopes toward the work. The ground presents no serious obstacle to attack for that direction, but of this approach and of the irregular slopes leading to Chorrera, the Almendares River, and the gates of the cemetery, the fortification has entire command. From Chorrera to Príncipe the distance is perhaps $1\frac{1}{2}$ to 2 miles in a direct line. The country intervening is somewhat rocky and broken, but there are few houses to intercept the view. Príncipe would be very difficult to reach by fire from the sea. It is the dominant work of Habana, and in some respects the most valuable.

El Príncipe is about 12,000 feet in a direct line from El Morro, and stands on the ground about 165 feet above datum

(viz: 187 feet above sea level), whilst El Morro stands on ground about 66 feet above datum, and the Cabaña about 140. The highest fortified point is just back of Casa Blanca, and stands on ground about 150 feet above datum.

ARMAMENT.

Two 12-inch Krupp guns, new.
Two 8-inch guns, old.
One 6-inch, old.
Two 8-inch howitzers.
Altogether, 60 pieces of all calibers.

GARRISON.

El Príncipe has a guard of more than 900 men, commanded by a brigadier general.

NOTE.

In Príncipe the foundations have been mined.

CAMPAMENTO DEL PRÍNCIPE.

Situated close to the fort of like name, in a northeastern direction, and at a very slightly less elevation, is a fortified military camp. Old earthworks are promiscuously scattered around its edges, but no doubt new and extensive earthworks have been constructed recently.

SMALL OUTLYING FORTIFICATIONS.

Every hill, ridge, crest, and knoll for some distance out of the city has either its blockhouse or fortina, which is a newly constructed form of redoubt built of large stone blocks. Some of these in a minor way are quite formidable.

ADDITIONAL DEFENSES AND AUXILIARY WORKS.

ABANDONED AS DEFENSES—USELESS AND UNARMED.

Amongst these may be placed the incomplete redoubt called Las Ánimas on a low hill in valley between Príncipe and Atarés, without armament, but garrisoned by about a hundred troops.

Las Ánimas will probably never be completed; it lies too far within natural defensive lines. It may be converted into a fortified camp.

Battery of San Nazario does not appear to be in existence; it is said that buildings are now used as part of cartridge factory near by.

Torreón de San Lázaro, erected 1556, mentioned as opposite Fort La Reina.

La Pastora Battery, lying about 500 yards south of Morro, on east side of bay, and nearly under the walls of Cabaña. Its field of fire was across the bay, the city, and toward the northwest; it is useless, and probably will never be restored. La Pastora is now used merely as a storehouse.

Punta de Tierra, described as being composed of two arches of stone buildings, serves as a means of transit for the immediate military camp and the outlying wards of Jesús del Monte and Cerro; also other highways of the west. It is supposed to be located near the Naval Arsenal.

Punta del Arsenal is described as "Covered by a simple arch between the bastions of San Isidro and of Bilan, serving as a more immediate pass between the precincts or districts and the arsenal by the way of Egido Street. It has no arms or guard." It is located on the arsenal grounds.

THE ARSENAL.

Constructed about 1725 as a shipyard, but now used merely for repairs. Placed in southeastern quarter of the city, on the bay, and occupying one of the worst of the fever-infected districts of Habana.

Located near the center of the waterfront, it covers acres and is surrounded on the shore side by a substantial wall about 8 feet high. It has fine dockage facilities, and all the other appurtenances of a first-class naval establishment of its character, including large machine shops and a marine railway. All the streets approaching it are narrow, excepting on its northern side.

The arsenal is not a defensive work. Ships are repaired here. United States Sailing Directions state: "At the naval arsenal are ways capable of taking up vessels of not over 500 tons."

It may be interesting to read the detailed description of it. "The first thing to be seen on entering the arsenal, or so-called navy yard, is a small guardhouse at its entrance, there being about six men on duty there at all times. Next to this is a larger building which is called the lieutenant's house, and is

the residence and office of the lieutenant of guards. To the right are the marine barracks and mess rooms. The yard also contains a fire-engine house, occupied by apparatus for the protection of the yard; a small machine shop, equipped for the finishing of fine work; a store house where steel and other materials are kept; a boiler house; a machine shop, which ordinarily employs about 75 men; a large boiler house; blacksmith shop; foundry; tinsmith shop; iron factory building, for wood turning and working; powder magazine; residence of commandant's aid and other officers; residence of captain and other officers; chief engineer's residence; general kitchen; sailor's barracks and mess room; large dry dock; officers' quarters, and the stable of commandant. The smaller buildings along the water front are not used. Inside, next the pier, are stored the old cannon, and at the same point is also a paint shop."

ARSENALS.

There is a cartridge factory, placed northeast of El Príncipe; capacity unknown, but probably small.

Ordnance repair shops placed on west shore of harbor near the cathedral.

There are no factories for construction of heavy guns or small arms.

There are no powder works in Habana.

ARTILLERY STOREHOUSE AND HEADQUARTERS.

On the Zuluete, three or four hundred feet from the Punta on the harbor side, in range with the Puerta, are the headquarters for the artillery force of the Spanish army in Cuba. This means the largest government machine shop, gun foundry, and repair shop; also a large warehouse stored with not only artillery supplies, but small arms also. In fact, this warehouse is an extensive but very poorly protected magazine in every sense of the word, for not only is it exposed to the fire of an attacking fleet, but there is nothing to shield its contents from such a fire. Visitors were permitted to stroll through it and the soldiers on duty smoked in the closest proximity to the ammunition. At this point a dozen or so old fashioned guns of about 6 inches caliber were mounted on the sea wall, the protecting stone rampart of which was about 2 feet thick. Adjacent to this is a cluster of other government military buildings.

HEADQUARTERS ARTILLERY ENGINEERS.

So given in the directories, and located in the narrowest point of the harbor's river entrance. There are some insignificant stone fortifications; in fact, the sea wall for quite a distance in this vicinity has embrasures for artillery, at which some of the old guns are mounted. They are the Puerta de Colón, described by the Spanish as follows: "Begun in simple form and with lifting bridge over the ditch, which is but a few yards wide. Has a body of guards and all accessories which are appropriate for the purpose. Commences on the curtain or wall which divides the bastion of San Juan de Dros and the Santa Angel."

THE PYROTECHNICA.

In this vicinity is located one of the most important plants in the city—namely, the Pirotecnica or small-arms cartridge factory. It turns out Remington cartridges, and within the last year machinery for the manufacture of Mauser cartridges has been reported to have been installed.

POWDER MAGAZINES.

Two on hill between Cabaña and No. 4, used and guarded.

San Antonio magazines, on low point at mouth of River Luyano, southern extremity of bay. A large supply of powder is said to be kept here.

Magazines of San José y Filipe, probably not rebuilt after destruction about 1885.

Naval magazine at Punta Blanca, southern arm of bay.

In 1741 was constructed a powder magazine called Jiguez, near the mouth of the river Luyano. Either disappeared or name changed.

BARRACKS.

Wooden barracks north of El Príncipe for garrison of that work. Barracks for a large number of men.

Cavalry barracks, west of Campo de Marte, within city.

Artillery barracks, San Isidro, near arsenal.

Barracks of Cabaña, southeast of fortification, and soldiers' quarters between Cabaña and Morro.

Military headquarters, near Plaza de Armas and La Fuerza.

Military school, near intersection Pasco de Tacón and Calzada de Belascoain.

Military hospital, near arsenal.

Smallpox hospital, north coast, west of Chorrera.

Other hospitals, prisons, gas works, markets, railroad stations, ferry landings, etc., see map.

From recent reports the following data are obtained:

At Cojimar there has been mounted a battery of mortars, 21 centimeters (8.2-inch), old patterns.

Between the Velazo Battery and Battery No. 2, in the Playa de Chivo, have been placed 6 old Ordoñez guns of 21 centimeters (8.2-inch).

In the curtain of the Valdez Battery* have been mounted 4 guns, old model, of 20 centimeters (7.8-inch).

In front of each of the shore batteries have been raised about 25,000 cubic meters of sand.

MILITARY HOSPITAL.

Adjoining the arsenal to the west is the large permanent military hospital. Strange as it may seem, this locality is considered to be the most unhealthy in the city.

STONE WALLS.

In both city and country districts are found substantial stone walls, of good height, jointed with a cement as hard as iron, which is also used to hold on the top of such walls the most vicious collection of broken bottles. Nothing short of artillery or explosives would reduce one of these walls, and to scale them, even with ladders, in their ordinary condition, if defended, would be an impossibility without badly lacerating the men who attempted it.

While not advancing a theory as to the proper manner in which to capture such obstructions, if defended, it may be mentioned that such walls and buildings hereafter mentioned are better defenses than most of the fortification playthings produced by Spanish engineers.

Thick native mats, made of fibrous materials or flat bundles of thatching materials, bound together with a palm-leaf rope, could be readily thrown over the walls and thus make their scaling comparatively easy, as same are not too high to be vaulted if hand holds or rests could be had at the top.

BUILDINGS AS DEFENSES.

The majority of buildings on the island, excepting huts in the country, are solidly built of stone, the walls of some being

*On sea wall, between la Punta and la Fuerza.

of surprising thickness, while the cement joints are like those already mentioned. Roofed with tile, it would be well nigh impossible to fire them, and with heavy shutters and doors closed and barred like a prison it is seen that many of them, if properly defended, could afford a strong resistance, but knowing the Spanish character, there would be little resistance in house-to-house fighting, and if it should occur, it is well to remember that the weak spot of these houses is the roof. The tiles covering them could be scaled off almost by bare hands, and usually there is little, if anything, but pole supports beneath them.

EXTENSIONS OF BUILDINGS.

On somewhat the same lines as the foregoing are small, defensive, semicircular extensions to the buildings at all important street intersections throughout the city. These are built of brick and stone, loopholed for musketry, and provided with either a sheet iron or heavy timbered door opening generally to the side walk, but in some instances cut through the corner of the adjoining building. These little forts, if they may be so termed, have all been recently built to resist Cuban attacks. They would conveniently hold from six to a dozen men each, and, as can be readily understood, if effectively garrisoned, could make things very disagreeable for a time at least to a force trying to occupy a narrow street; but, like the houses, the weak spots of these forts are the roofs. Some few have thin iron roofs, a few others zinc, but in most cases the covering is of tile or boards. Apparently their constructors have never considered the possibility of an attack from above, for, in addition to the weakness mentioned, there are no loopholes which would afford a vertical fire. None of these forts could withstand artillery fire for an instant, but if such were not available and they had to be taken against a strong defense, it would be advisable, after a start had been made, going through or over the roof of adjoining houses until directly above the defenses, which are only a short single-story high, then shooting through the roof or smashing them in with available house-roof tiles, if nothing better was at command.

Barricaded streets will also be plentifully found in the city.

ARMORED RAILROAD CARS.

While not liable to be much of a factor either in offensive or defensive operations against our troops, a possible reference should be made to the armored cars used by the Spaniards and which have proven effective against the insurgents.

SEARCH LIGHTS.

There are located at Habana four portable search lights, of French manufacture.

Engine, boiler, and dynamo are mounted so as to closely resemble a steam fire engine, while the search light of about 20 inches diameter is carried on an independent pair of wheels with a reel for wire, so that the light can be run a considerable distance from the generating plant.

These outfits are ordinarily located as follows: At the Morro, Santa Clara Battery, foot of San Lazaro street, and in the center of the Vedado.

DISTANCE MEASUREMENT.

In measuring the distance of enemy's ships, they now use as a basis the castle of San Diego and the powder factory—the verdices are the castle of San Diego, the powder factory, and the vessel.

SUMMARY OF ARMAMENT AND GARRISON AT HABANA.

The armament at Habana may be estimated at 43 new guns, the number of old ones being unknown.

Modern guns at Habana are—

Morro	Four 8 to 10 inch guns.
First battery east of Morro	Four 6-inch guns.
Second battery east of Morro	{ Two 12-inch guns.
	{ Four 8-inch mortars.
Punta	Three 6-inch guns.
Reina battery	Three 6-inch guns.
	{ Two 12-inch guns.
Santa Clara battery	{ One 10-inch gun.
	{ Two 8-inch guns.
New flanking battery adjoining Santa Clara	Three 4-inch guns.
First (east) Vedado battery	Four 6-inch guns.
Second Vedado battery	Four 6-inch guns.
Third Vedado battery	Four 6-inch guns.
Fourth Vedado battery (next Chorrera)	Three 6-inch guns.

These guns are principally of the Hontoria and Ordoñez pattern, but there are a few Krupps among them.

The strength of the garrison in Habana is estimated at 100,000, about evenly divided between volunteers and regulars.

Of course, it may be at any time increased by calling provincial troops to Habana.

The exact amount of arms in Habana is not known; but the armament on hand in depots, artillery parks, and stores of all the divisions of the army on the island of Cuba is as follows:

Mauser rifles and carbines.....	131, 015
Remington.....	137, 974
Of private guerrillas	14, 000
Total.....	282, 989

Out of this number only 30,000 are believed to be new.

CAPTURE OF HABANA BY THE ENGLISH IN 1762.

In January, 1762, hostilities were declared by England against Spain.

The English expedition sailed from Spithead March 5. After seizing the French West Indies the object was to make a descent on Habana, justly regarded as the key of the Spanish dominions in America. The first rendezvous of the forces to be combined with the original expedition was at Martinique, and Sir James Douglass was ordered to unite his squadron, stationed at Port Royal, Jamaica, with that of Sir Geo. Pococke, off Cape St. Nicholas, Santo Domingo. From this point Admiral Pococke, rejecting the course of taking the southern side of the island and doubling the western cape to gain Habana, resolved on following the shorter but more difficult as well as more dangerous course of the Old Bahama Channel, on the north side of the island, in order to take the enemy by surprise.

The junction was effected May 23, and June 6 the fleet, with the Earl of Albemarle's forces on board, lay to, 5 leagues to the eastward of Habana. The combined forces amounted to 19 sail of the line, 18 smaller ships of war, and more than 150 transports carrying 12,000 troops; in other words, a fleet of 200 sail in all, and a land force of 14,041 men.

The defenses of the city then consisted of the old wall on the west (completely covering the land side), of the Morro and Punta at the harbor entrance, of a small redoubt on the side of La Cabaña, and of 12 ships of the line, mounting 784 guns. The Spanish forces amounted to 4,600 soldiers, 9,000

seamen and marines, and 14,000 militia; total, 27,610. The time was summer, the rainy and the sickly season.

From the prisoners taken by the English June 2, in a naval skirmish some miles east of Matanzas, the fact became known that the Spaniards had in the harbor a naval force almost ready for sea.

Till then, too, the Governor of Habana was wholly unprepared. He was first warned of the approach of the expedition by a schooner which escaped the British pursuit. An immediate muster of his forces gave the figures above stated, and a council of war determined on the plan of defense. The Morro and the Punta were put under the command of naval officers, and their guns were to be worked by seamen, an arrangement which naturally gave great offense to the army. But it was urged in excuse that the artillery could be handled better by the navy than by the cavalry and infantry, of which arms the whole Spanish army, 3 companies excepted, was composed.

Meanwhile, on June 7, under protection of part of the fleet, the Earl landed his army, without opposition, on the beach, about 6 miles east of Habana, between the rivers Cojimar and Bocanao, while Admiral Pococke, with the rest of the fleet, bore away toward Habana.

To oppose the landing of the English, about 3,000 Spaniards were lying on the Cojimar River, supported by the castle at its mouth. The English army was put in motion to cross the river, while the fleet kept up a heavy fire on the castle, which soon surrendered, and the army passed unmolested.

Admiral Pococke lay off Habana 3 or 4 days, taking soundings with the smaller vessels. On the 8th the Spaniards sunk a large ship at the entrance to the harbor, another next morning, and a third on the 12th. The entrance was thus completely blocked; the English fleet was thus kept out, and the Spanish fleet was kept in.

While the Earl was landing near the Cojimar, the Admiral was creating a diversion by feigning to land the marines near the Chorrera, 4 miles west of Habana. The enemy was thus divided, and the force opposite the Earl could not prevent his landing and crossing the Cojimar. On the 10th, part of the fleet bombarded the Chorrera Castle, which was evacuated next day. Here the marines were landed on the 12th, and were joined by 1,200 men detached by Lord Albemarle, and

on the same day the whole fleet anchored off the Chorrera, where there was plenty of wood and water, 4 vessels being left in the offing. On the 11th, the bomb ship opened on the city, while, in the afternoon, the Earl assaulted and carried the Cabaña hill and redoubt, where he established his batteries overlooking the Morro.

It took the Earl till the 20th to get his mortar batteries ready, and the batteries of cannon were not ready till July 1. The division of the fleet off the Cojimar was actively employed in landing ordnance and stores, preparing trench material, and supplying the army with water from the river, as there was no water to be had on the Cabaña. The layer of soil on the rock was so thin that approaches could be made only with the greatest difficulty, and cotton bales were resorted to with success.

The fire of the batteries on the attacked bastion was combined with an attack by three ships on the northeast face. The ships were driven off, much damaged, and with considerable loss. But under the concentrated fire of the batteries, the bastion was finally silenced, July 16. The fire of the besiegers was retarded a great deal on account of the unexampled dryness, the trench material often taking fire, and once, on July 3, the principal battery was entirely burned up. Epidemical disorders began to make great havoc in the army and navy. The troops were but ill supplied with water and "refreshments," and by the end of the siege 5,000 soldiers and 3,000 sailors were on the sick list.

July 19 the besiegers reached the covered way before the right bastion, and began a new sap here. A breach was effected, the counterscarp was mined and blown into the ditch, and the work was finally carried by assault, July 30. New batteries bearing on the town were erected on the Cabaña and finished August 10. The city and Punta, being completely commanded by the Morro and Cabaña, capitulated on the 11th, after several hours' bombardment, and on the 14th the English were in complete possession. The English received as reinforcements about 2,000 men from North America during the siege, and lost in all about 2,500, of whom 700 died of the fever.

History relates that the prize money and booty, which amounted to nearly £1,000,000, was divided equally between the two services. Admiral Pococke and Lord Albemarle each got about £120,000. Ordinary seamen and private soldiers got from £3 to £4 apiece.

ENVIRONS OF HABANA.

DESCRIPTIVE.

(99)

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THE ENVIRONS OF HABANA.

GENERAL.

The topography of the country about Habana is peculiar. In general the city is surrounded by a hilly region covered with grass, crops, and garden produce, well watered by streams and free from marsh, except about the bay itself. There is but little timber, and isolated trees, chiefly the royal palm and ceiba, are common. The face of the country is broken naturally by hills and wooded ravines and artificially by stone walls, hedges of cactus, wire fences, single houses, and hamlets or towns. There are few streams of large size, and generally the country may be said to be favorable to the movements of troops and not materially unfavorable to the use of cavalry; but in wet weather guns and even horses would find difficulty in moving by the country roads and across fields. Beginning at the east toward Cojimar a sandy ridge, covered with brush, but with no large timber, follows generally the shore of the gulf, terminating at the Morro and in the low bluffs of Cabaña, which rise hardly more than 50 feet above the sea. This ridge, as it runs westward, spreads out almost into a plateau descending gradually toward the south into the valley broken by hills, which lies between Guanabacoa and Regla southward from the former. Continuing the sweep to the westward on a radius of 3 to 4 miles, the country maintains its hilly character; hills rounded and cultivated; valleys cultivated, but becoming low and marshy as they approach the bay.

From the heights of Jesús del Monte south and southwest, the hills grow fewer and lower; the country becomes more level as the broken valley is reached which extends from the southwestern extremity of Habana Bay toward and beyond Ciénaga.

In this valley lies the Marianao Railway and the Habana Railway to Rincón, the old and new aqueducts that chiefly supply the city with water, and the turnpike to Guanajay. Parts of the valley are almost a swamp that in wet weather probably becomes impassable for horses.

Continuing the sweep westward, on the line given, a ridge near Ciénaga or Puentes Grandes is met, which follows the course of the Almendares River northward to the gulf at Chorrera; 4 miles west of Habana Bay this high ground continues southwest along the valley of Ciénaga and to the heights about Marianao, then dropping off gradually to the gulf.

Around about the Almendares River from Puentes Grandes to the sea the soil is barren, sandy, covered with brush, and but little cultivated. Here lies the conspicuous ridge seen from El Príncipe to the west and northwest, and apparently, but not in reality, dominating that position. Such is the general character of the country, lying at a distance of $3\frac{1}{2}$ to 4 miles from the plaza de Armas, of Habana. Beyond this line the city is concealed by the hills which surround it. The country east is broken, hilly, and frequently wooded, crossed by the Bay Railroad, from Matanzas. Southeast it is similar, while southward it opens from the hills of Jesús del Monte into a broken valley through which passes the Western Railroad. Southwest the valley of La Ciénaga followed by the Habana Railroad gradually grows higher, lumpy, and brush-covered as it continues on to Rincón, while westward of this valley a broken country extends to Marianao, through which the highway passes to Guanajay. North of the highway there is no railway or important road approaching from the west. The railroad from Marianao to La Playa descends the heights to the seacoast, crossing a rolling region, cultivated and open. Westward from this line toward the heights of Mariel the region seems hilly and broken.

From a military standpoint, the environs of Habana may be considered as lying within a broken line beginning at the mouth of the Marianao River, at the inlet called La Playa de Marianao, approximately 7 miles from Habana Bay; thence following southward the turnpike and railroad to Marianao and Quemados, thence by the turnpike and railroad to Puentes Grandes. Puentes Grandes lies on a ridge which, running off in a southwesterly direction, commands to the eastward the valley traversed by the Habana Railroad. This valley extends northward toward the hill of El Príncipe, the Hill of the Jesuits, and the suburb and hill of El Cerro. From Puentes Grandes lines would continue by rail and turnpike to La Ciénaga; thence, avoiding the low ground east of Ciénaga, by rail and road to El Príncipe; thence to the Hill of the Jesuits, thence across low cultivated fields to El Cerro; thence

across a valley, low in places and broken, to the hills about Jesús del Monte; thence eastward and northward across a rolling, broken, partly wooded country to Guanabacoa and the commanding positions near by that overlook Habana, about 3 miles away; thence following the turnpike northward to a hill occupied by a conspicuous white house near the ridge of Cojimar, thence by turnpike to the inlet Cojimar, $3\frac{1}{2}$ miles from Habana; thence by the north coast to La Playa de Marianao, about 11 miles distant from Cojimar.

The western extremity of the line of defenses would rest more properly at Chorrera, the mouth of the Almendares River, and thence continue along that river to the heights of Marianao, but both the railroad and turnpike from Habana to Marianao continue to La Playa, and this point would necessarily be defended against a sea attack.

LINE OF COMMUNICATION.

It is necessary to consider very briefly the lines of communication entering the outlying region of Habana and the lines of communication within its limits. The railroads entering Habana are:

1. The Western Railway, from Pinar del Río, with its terminal at the station of Cristina, near the fortification of Atarés. The important points reached by this line are—

	<i>Miles.</i>
Pinar del Río.....	109
Consolación.....	94
Rincón.....	15

2. The old Bahía Line, now a part of the United Railways System, from Bemba and Matanzas to Regla. The important points reached by this road are—

	<i>Miles.</i>
Cienfuegos.....	192
Sagua la Grande.....	186
Cárdenas.....	86
Matanzas.....	54
Bemba.....	

3. The United Railways, from Batabanó, with branches to Guanajay, Güines, and La Union. Its terminal is located in Jesús del Monte. The important points reached by this line are—

	<i>Miles.</i>
Güines.....	45
San Felipe.....	27
Batabanó.....	36
Guanajay.....	36
Rincón.....	16

4. The Marianao Railway, a suburban line running a distance of 8 miles to Marianao.

5. The dummy line from Habana to the suburban town of Guanabacoa.

6. The Belt Line, connecting the suburban towns of Chorrera and Vedado with Habana.

RAILROAD STATIONS.

There are at present but two railroad stations in Habana and one in Regla, or perhaps two in the latter place if the old station of the dummy line to Guanabacoa is considered one. The Habana stations are the Western (Cristina), a good structure, and the Concha, the terminus of the suburban line to Marianao.

The old station of the Habana road called Villanueva, near the Campo de Marte, has been abandoned; and at present the trains start from the outskirts of the city at a shed called Pueblo Nuevo.

FERRIES.

Between Habana and Regla are two ferries; from the one nearest Morro goes the dummy line to Guanabacoa; from the other starts the Bay Road to Matanzas and Guanabacoa.

TURNPIKES.

The turnpikes and important roads entering Habana are:

First. From Cojimar by the north coast to Cabaña and the Morro; thence a crossing is made by irregular ferry to Habana. Distance, about $3\frac{1}{2}$ miles.

The road is probably good at all seasons, though not a turnpike. It runs along the shore of the gulf at an average distance of perhaps 200 yards. It is a narrow road (wide enough for one wagon), nearly level, lying generally through low brush, which is sometimes thorny; it is sandy, overlying a bed of rock, can never become muddy, and is never sandy enough to make it difficult; a very fine road, lying, in general, but slightly above the sea level. The brush on either side could be readily cleared away. Inland, the ground is level for a seemingly long distance to the left. This level ground apparently runs to Guanabacoa, and the hill of the White House ends at the town, as does the ridge west of Cojimar; therefore, this shore road from Cojimar is about on

the level of the valley of the railroad from Regla to Guanabacoa. Consequently the level ground to the left is, as it appears, some miles broad. On the sea side and inland in one or two places, there are quarries within perhaps half a mile of Morro. These are not deep, one being inland, perhaps 6 feet, the other more to the seaward even less deep. They would be strong places for infantry and light guns.

About half a mile from Morro the road ascends slightly the hill of the castle, and passes between Morro and Cabaña down the slope to a dock. This road strikes the rear of Morro. Being somewhat shut in by brush, it seems to be almost free from danger from the guns of the forts, but is probably not so.

San Diego must certainly sweep it at right angles. The highway from Cojimar is good at all seasons of the year. The road could readily be widened; at present it has but a single track.

Second. From Cojimar via Guanabacoa, thence to Regla. Distance, about 6 miles. A good turnpike.

From Cojimar inland the turnpike ascends a long but not steep hill, covered with brush and uncultivated; it is a good wagon road and probably never muddy. Beyond the crest to the left lies a creek of brackish water, unfit to drink. The turnpike descends over undulating hills to the valley south of the ridge and runs along the flanks of a considerable hill, surmounted by an old white stone house, probably 2 miles from Guanabacoa. This house stands on the summit of the hill, and from it a fine view of Habana and its harbor is obtained, about 3 miles away in a direct line. Heavy guns here could readily reach the greater part of the town. On the summit of this hill there appears to be sufficient earth for the construction of works. The summit and sides are covered with low, thick, and thorny brush. The road ascends the hill, throwing off a branch to the west toward the house mentioned.

Beyond this hill of the White House the road continues through fields over a fairly level country until it ascends the slopes on which Guanabacoa lies.

From Guanabacoa to Regla the turnpike descends by easy slopes to the ferry landing—a good wagon road at all seasons. Probably exposed to fire from Atarés, and to some extent from El Príncipe, Cabaña, and San Diego.

Third. Calzada (highway) from Guanabacoa around eastern shore of bay to the Calzada of Luyano, thence by Calzada de Concha to the southern section of Habana.

A fine turnpike in good condition at all seasons, crossing the Bay Railroad about a mile from Regla Ferry, and following closely the bay shore and the belt railroad from La Ciénaga lying east of the latter. The shore toward the bay is generally low and sometimes swampy; eastward the country is broken with many wooded hills that come down to the turnpike. Luyano Creek, crossed by bridge (stone), near by, enters the turnpike called Calzada de Luyano from San Juan de las Lajas, a place of small importance. This turnpike is only important as a connecting line. It is probably exposed to fire from Atarés, Príncipe, Cabaña, and San Diego.

Fourth. Calzada de Jesús del Monte. A most important turnpike coming from Rincón and Bejucal. It joins about 4 miles from Habana an unimportant branch coming in from Managua, and near Jesús del Monte intersects the Calzada de Cristina near its meeting point with the Calzada de Concha from Luyano and Guanabacoa. It is one of the most important roads of Cuba in event of hostilities. From Rincón to Habana it follows the general course of the Western Railway, and reaches the rear of the important Key Hill, near Jesús del Monte, without being exposed to fire from the works about Habana. At this suburb the turnpike virtually reaches the city.

Fifth. Calzada del Cerro from Puentes Grandes, Marianao, La Playa de Marianao, Guanajay, Mariel, Cabaña, and Candelaria. A turnpike good at all seasons and a very important road, whose branches reach two vital points of the north coast, Mariel and Cabañas, and Coloma, an important point of the south. From Puentes Grandes this road, crossing the low valley to the Cerro, is exposed to fire from Príncipe, probably from Atarés, and would be swept by guns placed on eminences south of Habana. Near the Cerro this highway is joined by another highway called the Calzada Palatina, a very important road following in part the new aqueduct and joining the Calzada de Vento, that comes from the Vento Springs to the Calzada of the Cerro. The two turnpikes follow nearly the line of the main water supply of Habana.

Sixth. Road from La Ciénaga and the Calzada de Marianao northward, fairly good but not a pike. It passes along the

slopes of the valley southwest of Habana, and, running just west of Príncipe, strikes a calzada from the Paseo de Tacón to the cemetery west of the redoubt and close to Chorrera.

Seventh. A turnpike, more or less bad, following the north coast and suburban railway through Vedado to Chorrera, the mouth of the Almendares River, and continued by a very bad road to La Playa de Marianao; thence by a fine turnpike to Marianao and the fifth turnpike mentioned.

This road along the north coast westward from Habana may be said to leave the city near the fortress of La Reina, on the inlet San Lazaro. About 500 yards beyond this, near Santa Clara, it is intersected by the important calzada of La Infanta (see below).

Close by this intersection are quarries, perhaps 30 feet deep, lying east of Santa Clara. They open at the level of the road and form excellent places for the withdrawal of troops out of sight as well as out of danger.

Passing under the guns of Santa Clara, the road continues to Vedado, in general parallel to the coast and between the dummy track and the sea. This road is excellent, and probably remains so at all seasons—a light covering of sand over smooth rock. The shore is low, but not sandy, the sea breaking upon the bare shelving coral rock. The coast west of Habana rises hardly more than a foot or two above the water. It consists of ragged coral rock, honeycombed by the sea. There is no beach from the cove of San Lazaro to Chorrera. Boat landings would be dangerous at all times; impracticable except in the quietest weather.

Between Santa Clara and Vedado there are numerous small quarries, from 3 to 8 feet deep, that would form excellent rifle pits. From these the stone has often been taken in steps. The edges of the quarries are frequently concealed by a growth of brush. West of Vedado there are few or no quarries. On this north coast, therefore, are found ready to hand many excellent emplacements for mortars, or for guns on depressed carriages, as well as places of shelter for infantry. Many of these abandoned quarries are within a few yards of the shore and offer complete concealment and shelter from the sea. They would be excellent places from which to resist boat landings. They vary in depth from a foot to 40 or 50 feet, and are very numerous. The turnpike continues, near the dummy line, through the streets of the suburb of Vedado, which is

almost a part of Chorrera, and terminates at the Almendares River. The shore road is continued west by a heavy, sandy road, which is reached by a ferry across the Almendares, some 500 yards above the wreck of the bridge that once stood there. From the crossing it continues on to La Playa de Marianao.

From Habana to Chorrera the road is exposed to fire almost all the way from one or more of the forts of Príncipe, Santa Clara, La Reina, La Punta, El Morro, and Cabaña; but from Príncipe both road and railroad are sheltered to some extent by a low range of hills, which are rather the termination of the higher ground lying back of the coast. This ridge follows the general trend of the shore from Vedado to the Almendares River, at a distance of perhaps 600 or 800 yards from the water. No other roads of importance enter Habana.

TO RECAPITULATE.

There are leading to Habana four main roads called calzadas. First, from La Punta along the north coast (and railroad) to Vedado and Chorrera, where it stops at the Almendares River; second, the Calzada del Cerro, which continues on to Marianao and thence to Guanajay, there dividing, one branch going to Artemisa and San Cristóbal, the other to Mariel and Cabaña; the third, through Jesús del Monte to Rincón and Bejucal, throwing off near Cristina a short calzada that passes around the bay, to a second branch which leaves the Jesús del Monte calzada near the car stables, and goes to the left to Luyano, and there branches, the left going to Guanabacoa, the right to San Juan de las Lajas. The main calzada to Jesús del Monte continues south, and at about 4 miles from Habana branches, the right and important branch going to Calabazar, Rincón, and Güines, the left to Managua. The third and last calzada is the poor one from Regla to Guanabacoa, thence to Cojimar. The road past Príncipe to the cemetery, where it rests, is a sort of calzada. These are the main highways leading from Habana. From the Cerro a calzada called the Palatina follows, for a time, the Western Railroad, but, branching at about 4 miles toward the south, continues to Vento.*

These calzadas, kept up by the department of public works under the civil governors of the provinces, are always good

*The calzada from Regla branches, one going northward toward Cojimar, the other branch going southeast into the country.

highways. Those of the first order, like that to Marianao, are fine, wide boulevards, smooth and rounded, and, as a rule, do not become heavy. In the cities they come under the control of the municipal governments, and are frequently in wretched condition. All calzadas indicated on the map that have not been abandoned (which is rarely the case, except when railroads have taken their place) may be considered as fine wagon roads; but the other roads of the country are bad dirt roads or mere trails that become almost impassable. The calzadas are comparatively few.

INTERIOR LINES.

The interior lines of communication within the defensive position outlined are, of course, excellent, since they are chiefly the streets of the city. It is only necessary to mention the tramways and a few of the outlying calzadas which afford belt roads. Of the tramways there are three main branches radiating from the center of Habana, and two others which are connecting links. Of the main lines the most important is the street-car line to Jesús del Monte, running from the center of the city to stables in that suburb within about a mile of the Key Hill.

Second. A suburban line running by the Calzada del Cerro to stables on the western outskirts of that village.

Third. From the interior of the city to El Príncipe, one connecting line runs from La Punta—the end of the railway from Chorrera—to Aguiar street, from which all cars start.

Of the interior calzadas it is only necessary to mention two—La Infanta, an important belt road starting from the north coast at the large quarries between Battery Santa Clara and La Reina, and sweeping around Habana to the Calzada of Jesús del Monte, cutting the Paseo (the road to El Príncipe), the Calzada of the Cerro, and continued by the Calzada of Jesús del Monte to the Calzada de Cristina, which joins the second important belt road, the Calzada de Concha, that goes on to Guanabacoa and Cojimar. These two roads and their links form a line around Habana, beginning near Santa Clara Battery and going east to Cojimar. These points are connected by good coast roads with the opposite shores of Habana Bay. The Calzada de la Infanta continues to the crossing of the railroad to Marianao, which leaves from the Concha Station. On the right, near this station, the ground is somewhat

high and rolling; to the left, *i. e.*, east, it is low, becoming lower as it runs down toward the head of the bay, where, indeed, it becomes marshy in places and would be difficult to cross with wagons, toward the Calzada de Belascoain.

It may be well to add that at Chorrera there is now no bridge across the Almendares River, and by the north shore communication is had with La Playa de Marianao only by a very heavy sandy road, little used.

DETAILED STUDY OF THE ENVIRONS.

The position along the following lines requires more detailed study.

From the city proper by road to Vedado and Chorrera, thence up the Almendares River toward Puentes Grandes (a detour), and on to La Playa de Marianao; thence to Marianao, Puentes Grandes, La Ciénaga, El Príncipe, Hill of the Jesuits, Tulipan and El Cerro, Jesús del Monte and the Key Hill, Regla, Guanabacoa, Cojimar, and back to Habana Bay at El Morro.

Following the north shore westward, Vedado is reached about 3 miles from Habana, and a mile westward, the suburb of Chorrera. Both are fairly healthy and prosperous suburbs, with many fine residences occupying low ground between the gulf and the ridge that runs parallel to the shore. Here the soil is light, covering but slightly the underlying coral rock.

These suburbs are becoming more and more the residences of the rich people of Habana, the streets of one running into those of the other. Vedado lies about half a mile north of Príncipe. Chorrera—see sketch—is at the mouth of the Almendares River, on a well-sheltered inlet with a sandy, shelving beach of coral sloping to the water, with here and there a sandy cove where boats can land. A few boats are habitually kept there. The depth of the water on the bar at Chorrera is said to be 6 or 8 feet. It is to be remembered that the tide here rises only about 2 feet.

At the west of the inlet on the seacoast are large oil refineries. On the east shore at mouth of the river is a square stone tower built three centuries ago, now worthless as a defense and said to be unarmed. Near here lands one end of the cable from Key West. The wires thence are said to be buried along the railroad line.

Both railroad and turnpike end at Chorrera. The bridge which formerly spanned the river near its mouth is now useless. A crossing is made by ferry some 500 yards above the wreck of the bridge.

Two roads, necessary to notice, pass inland from the coast. The first is from Vedado—a common dirt road, little used—striking inland toward El Príncipe. This becomes almost impassable in wet weather, but in dry weather is a fair wagon road, ascending gradually the hill of Príncipe, which lies about half a mile south of Vedado. At first the road runs in rear of a low shelving ridge that hides the city and, to some extent, El Príncipe from view. This ridge is short. Toward the gulf it terminates in gradual slopes before reaching the line of the railroad that lies about half a mile from the gulf shore. Toward the hill of El Príncipe the wagon road terminates, but a byroad continues along the western slopes of the fortification, passing over brushy ground having a covering of soil probably of no great depth, and reaching finally the calzada of the cemetery, which continues to Chorrera. From this road a fine view is had northwest, west, and southwest over a lower country broken here and there by hills on which are growing grass, crops, and trees. North of west (nearly west, however, as the shore line from Vedado trends south of west), and perhaps $2\frac{1}{2}$ or 3 miles away, lies the village of Chorrera, at the mouth of the Almendares River. From El Príncipe the calzada continues to the cemetery gate. This road passing along the hill would make an excellent place to station troops—infantry and guns—to resist a landing at Chorrera and an advance along the north coast. From the gate of the cemetery a road turns nearly at right angles, leading to Chorrera and the mouth of the Almendares, some half a mile distant. The cemetery walls are of brick or stone, and would offer a fine shelter for infantry. The ground slopes toward the houses of Chorrera, but the village to some extent covers and conceals a boat landing from the view of Príncipe and this road.

The second road is from Chorrera, up the Almendares River. It follows the ridge running parallel to the north coast, continues to within a few yards of the Almendares River, then turns sharply to the south and follows the right bank of the stream, growing higher as it recedes from the gulf shore. This branch road, following the river bank into the country to the first dam of the Almendares, about three-fourths of a

mile above Chorrera, there crosses to the west bank and goes winding on to Puentes Grandes. Some 400 or 500 yards from the town of Chorrera and on the right bank of the river, where the hills are perhaps 60 feet high, are limestone quarries. The road following the Almendares River is covered in general from Habana and Príncipe by the open hills lying along the east side of the river; it continues to Paso de la Madonna, always out of sight of Príncipe. At Paso de la Madonna was formerly a bridge, which has now disappeared; the road crossing here to the west by ferry, probably for foot passengers only, continues on to Puentes Grandes. The river can not be forded here nor below. It is deep, rapid, has high steep banks, and at Paso de la Madonna is, perhaps, 30 yards wide. At Puentes Grandes is the first bridge; there is said to be a ford a few hundred yards below this. This ford is about one-half mile below Puentes Grandes; it is good, about 3 feet deep ordinarily, rock bottom, shelving banks; but in the bottom are large stones. The road here crossing to the left bank goes on to Puentes Grandes. In wet weather the ford could not be used; however, in wet weather the roads west of the Almendares would become practically impassable. Along the Almendares River the country is rough, the hills are steep, uncultivated, and generally without houses. These hills form a ridge extending towards Marianao, but all are, apparently, commanded by El Príncipe. Between Chorrera and the hills near Paso de la Madonna the hill of Príncipe is generally concealed by others and by the hill of the cemetery. An attempt to cross the Almendares, therefore, should not be made at a point lower down than the bridge or ford near Puentes Grandes. No advance could be made across these hills.

ROAD (NORTH COAST)—CHORRERA TO LA PLAYA DE MARIANAO.

The turnpike is continued west from Chorrera by a very bad road. The Almendares River is crossed by a ferry boat capable of taking two ox carts at a crossing. It is drawn by an endless rope and windlass, the boat held in its course by a guard-chain stretched across the river and running over the boat. The banks of the stream at the ferry are rocky, but fringed by small bushes. The river here is not more than 50 yards wide, but is 12 or 15 feet deep and with a somewhat rapid current; deep water runs to the banks on either side,

where the road landings are low. Without a bridge it would be hazardous to attempt to cross here. Pontoon trains might well be used, but any force placed on the high ground in rear of Chorrera could without much difficulty prevent a crossing.

Beyond the Almedares River the road, evidently bad in wet weather, continues through a low country. The underlying rock is of limestone, soft, and upon trituration, forms a sort of mortar, which makes the road practically impassable for wagons and almost impassable for horses. Just beyond the ferry a low hill rises, forming part of the ridge, which bends to south and west, then turns to the north, and forming a segment, of which the shore road to La Playa is the chord. On this hill and near the river is a house, whose stone walls and stone steps, ascending the slope by terraces, make it appear a fortification. Near or on the gulf are oil refineries. The road shows evidences of mud in wet weather. On the north it is lined for nearly a mile by a stone wall that separates it from a flat country, densely covered with brush, and resembling a high growth of weeds. Here, not far from the gulf shore and the oil refineries, stand isolated the large reddish buildings of the smallpox hospitals, used in cases of epidemics, which are by no means infrequent.

The road continues a single track, narrow and badly cut up, with frequent diverging roads, running generally to sand quarries on the shore. The brush on either side becomes dense; it is chiefly the wild grape, which here grows into a tree, the wood of which is excellent for fuel. The low ground continues for half a mile, but the road, which in January is dry, though rough, becomes more sandy and harder, running to within a few yards of the sea, and behind a low, sandy ridge parallel to the shore. This ridge is covered with dense brush and slopes to the water. The shore in the immediate vicinity of the water is rocky, low, and shelving to the water's edge, with sand in rear of the rocks. As the road continues behind this ridge, coming out now and again upon the shore, it grows more sandy, and in places so heavy that it would be difficult to haul wagons or guns through. The country inland is low and brush-covered, with a very few trees, and extends in a barren waste to the semicircle of bounding hills $1\frac{1}{2}$ or 2 miles away. These hills are gentle slopes, green, dotted with palms and houses, and evidently very fertile. They are the heights about Marianao.

Continuing over the sand and through the brush described, the road, about 3 miles from the crossing of the Almendares River, strikes the inlet or bay of La Playa de Marianao. The sand here is deep. The road, turning to the left, follows the shore of the inlet to the station of the single-track railroad to Marianao (thence to Habana), near which, after crossing a very small rivulet of water, probably not fit to drink, it reaches the calzada to Marianao. The inlet called La Playa is of some importance; it lies at a distance of about 7 miles from Habana Bay. It is without defenses. The small old Martello tower, apparently abandoned, is not worth considering.

LA PLAYA DE MARIANAO.

La Playa is a sort of summer resort. It consists chiefly of a few huts of fishermen, whose nets, fish cages, small sail and row boats line the shore. Seemingly there is not much water within the line of the little cape, but it is an excellent place for a boat landing. From it an advance could well be made to Marianao, lying on a ridge to the southeast and about $2\frac{1}{2}$ miles distant by rail or by the turnpike.

Considering the nearness to Habana, the easy railroad and road communication by the way of Marianao, there would be considerable difficulty in landing a hostile force at La Playa, and still more in advancing by the shore road to the Almendares River. This road is impracticable in wet weather, and a concentration of the defending forces at Chorrera would make a crossing there difficult, probably impossible. The low ground east of La Playa is open to view from El Príncipe, though the distance is great. From El Príncipe to the low ground near the Almendares is probably 2 or 3 miles. The country from Príncipe to the river at this point is a succession of ridges or low hills, somewhat broken, but lower than the hill of El Príncipe and gradually rising toward it.

The high ground within a mile or less of La Playa on three sides would offer good positions for batteries in case a landing were anticipated there. This ground is rolling, the low hills rounded and cultivated. They should be occupied at once upon landing. This could be effected without great difficulty. The same is true of the ridge at Chorrera. In itself the latter would be preferable as a landing place, as the Almendares would not have to be crossed nor the low ground between Chorrera and La Playa passed. But so near Habana and

with the best road perhaps of all the region leading to the city, as well as the double track of the suburban railroad, the defense to be expected from ships running out of Habana and patrolling the coast, and the undoubted concentration of troops from Habana on the ridges above Chorrera, as well as the exposure of boats to the fire of improvised shore batteries and from Príncipe, would make a landing at Chorrera about as difficult as a landing in the harbor of Habana itself. La Playa de Marianao would be in some respects better, especially as there are two lines of advance open from there—one by the shore road (which should not be taken unless the circumstances were specially favorable), the other by road and railroad to Marianao, thence by road and railroad to the city—but both these lines of advance would approach the city from a wrong direction, being exposed to the guns of Príncipe.

LA PLAYA DE MARIANAO TO MARIANAO.

The country intervening between Marianao and the inlet is free from brush or timber, and, except in occasional ravines, is rolling and open, with a few stone walls and grass-covered hills, dotted with palms. The chief crops raised are garden truck for the Habana market. The country between Marianao and La Playa would not be difficult for cavalry.

For about half a mile from the shore the turnpike runs through low ground, not swampy in dry season, but covered with low brush to the foot of a small hill, which dominates the road and to some extent the harbor. On this hill is a stone building used as a tannery. The road is lined on the north by a well-made stone wall, and is almost parallel to the railroad, the latter lying perhaps 500 yards to the right, the distance decreasing as Marianao is approached.

The turnpike beyond the tannery traverses a succession of ridges, whose slopes are not steep. One horse readily draws 4 people. The pike itself is good, well paved, and evidently never muddy. It is wide enough for 2 vehicles to pass. The hilltops generally are rounded, covered with good grass, and the whole appearance of the country green and fertile. The undulating road continues gradually to ascend, and forks about 2 miles from La Playa, the northern branch going to Quemados, some 400 or 500 yards beyond; the southern to Marianao, about the same distance away; in fact one village is but a continuation of the other. Some 200 yards beyond

this fork the southern branch crosses the track of the railroad to La Playa, and about 300 yards beyond reaches the station of Marianao. The railroad to La Playa is a continuation of the railroad from Habana to Marianao. From Marianao to the gulf shore it is a single track, 4 feet 8½ inches gauge.

The station lies on a hillside on the outskirts of the village of Marianao. Passing by this and ascending a somewhat steep hill, the turnpike reaches the main turnpike from Habana to Guanajay, about 30 miles distant.

MARIANAO.

Marianao is about 6 miles from Habana. It is a residence suburb of that city; is very healthy and prosperous; contains about 2,000 people and many pretty residences. The houses are chiefly of stone, surrounded by gardens and trees. There are a few frame buildings. On the outskirts of the town is a little stream of good water flowing through a large ravine, spanned by a massive stone bridge that, without explosives, could be destroyed only with difficulty. The destruction of this bridge would do little harm.

From Marianao the turnpike runs northward to Puentes Grandes, about 3 miles away; here it crosses the Almendares River by an iron bridge, to reach which, the road descends a somewhat steep hill. Near Puentes Grandes there is a dam. There are fords of the Almendares River about half a mile above and half a mile below the bridge; the river is also fordable just below the iron bridge. On the farther border of Puentes Grandes is another small stone bridge across a little stream, here fordable.

PUENTES GRANDES

Puentes Grandes is one of the suburbs of Habana. It lies about 3 miles from the Plaza de Armas and about 2 miles above Chorrera on the Almendares River. Some 300 yards from Puentes Grandes the road from Vedado enters along a ridge. To the east of the calzada lies a valley broken here and there with rounded, green and palm-dotted hills, through which passes the Habana and Marianao railroads. About a mile from Puentes Grandes the calzada intersects the Habana Railroad at Ciénaga, where the belt road from Regla taps it. This intersection is about 4 miles from Marianao, and about

the same distance from the Plaza de Armas in Habana. About 200 yards beyond the intersection the turnpike crosses the railroad from Marianao. Ciénaga is thus a somewhat important junction. The Marianao Railroad is crossed twice by the turnpike after leaving Marianao—once just before reaching Puentes Grandes, where the railroad runs through a tunnel and the turnpike passes over it on a wooden bridge, and once at Ciénaga.

LA CIÉNAGA.

La Ciénaga is a station on the Habana Railroad about 4 miles distant from the Plaza de Armas of Habana and about the same distance from Marianao and about a mile from Puentes Grandes. It lies on the outskirts of the city proper and at the foot of the ridge bounding the valley southwest of Habana.

The hills near Ciénaga command well the valley, railroads, and turnpike. At the station there are several tracks, railroad workshops, and sheds for engines. Probably several spare locomotives are always kept here. The railroad and calzada crossings are within 200 or 300 yards of each other, and the Regla branch runs into a "Y" in the valley to the east.

As the name (The Swamp) implies, Ciénaga is placed on or near low ground. Eastward a low valley that probably becomes marshy in wet weather extends toward the line of the Western Railroad. Around Ciénaga this valley is open and cultivated with garden produce. It is exposed to fire from the guns of El Príncipe and would be exposed to fire from guns placed on El Cerro, and the Hill of the Jesuits. From Jesús del Monte it is cut off by hills and trees. At La Ciénaga the Habana Railroad, the Marianao Railroad, the belt line to Regla, and the turnpike to Marianao, Guanajay, and the west all meet; railroads and the turnpike run from this point through the valley and are exposed to fire from Príncipe. The Habana Railroad, passing a small cut, which partly shelters the junction, workshop, etc., of the station from the fire of El Príncipe fort, runs directly through low ground, ditched and cultivated in the dry season, toward this fortification, while the Marianao Railroad runs through the valley to its station at La Concha. The belt road is exposed to fire from El Príncipe and Átares.

Half a mile beyond La Ciénaga the turnpike reaches the stables and terminus of the street car lines to El Cerro. Thence the heart of the city is reached by the Calzada del Cerro. It is evident that an advance by calzada, or by rail, from Marianao would land a force in Habana under the guns of El Príncipe.

El Príncipe is about 3,000 yards from the ridge just north of Ciénaga, which shelters the shops from the fire of the guns. The ridge of hills westward of Ciénaga continues along the Almendares River, but they are dominated by El Príncipe. Along the foot of this ridge a road runs, joining La Ciénaga with the turnpike from the Paseo de Tacón, to the cemeteries. This line would no doubt be occupied by defenses; nevertheless, it is the only line of advance that should be taken from La Ciénaga in case of an attack from the direction of Marianao.

From Ciénaga the defensive line to El Príncipe, in order to avoid the open valley through which railroads and calzadas run, would probably pass along the hills bordering the Almendáres, in front of which is the dirt road mentioned as running to the turnpike from the Tacón to the cemeteries. This road, being somewhat rocky, probably never becomes impassable; it is for the most part sheltered from the fire of El Príncipe, and largely, by the configuration of the ground, from that of the heights along the river. It passes close by the Baptist cemetery and reaches the hill of Príncipe about 2 miles from Ciénaga. At the base of this hill runs the turnpike, and beyond this turnpike the defensive line is continued by a road to Vedado and the coast.

EL PRÍNCIPE.

El Príncipe is undoubtedly the strongest natural position about Habana now occupied by defensive works.

Its guns sweep the heights of the Almendares, extending from the north coast southward by the hills of Puentes Grandes to the valley of Ciénaga, thence eastward across the Hill of the Jesuits and the long line of trees and houses leading to the Cerro. The country beyond El Cerro is partly sheltered by trees and hills, but eastward El Príncipe commands in places the country and the bay shore, and gives fire across Habana seaward. This hill is the most commanding position now occupied; in fact, there are but two or three available positions superior in location and command.

From El Príncipe to the Hill of the Jesuits is a fair wagon road. This hill, much lower than El Príncipe, about 1,000 yards distant, and commanded by that work, is occupied by the large buildings and walls of the Catalán Club. It would form a good defensive position against an approach from the south.

From the Hill of the Jesuits to the hill and suburb called El Cerro, roads pass back to the city, thence out by the turnpike of El Cerro. The ground intervening is low, marshy in places, but in the dry season passable for foot troops. The distance is about 1,000 yards to the village of Tulipan.

TULIPAN.

Tulipan is a small suburb and place of residence, really part of El Cerro. It is reached by a good road and by the Marianao Railroad. It is unimportant, but clean and healthy; has a square or almeda, surrounded by pleasant houses, many of which are of wood.

EL CERRO.

El Cerro is a suburb and place of residence, reached by turnpike and street railway; really part of Habana; needs no description; car stables are placed here.

The hill juts out into the southern valley; field works placed here and at the Hill of the Jesuits would, with El Príncipe, completely command the valley south and southwest of Habana Bay, the turnpike to Marianao, Guanajay, the Habana Railroad from Rincón, the Marianao Railroad, and the belt line to Regla.

Two approaches from the south are sheltered from these positions, viz, the Western Railroad and the turnpike from Rincón. Eastward from El Cerro, toward the suburb of Jesús del Monte and the hills south of it, lies a valley broken by hills, trees, houses, and gardens; the road runs back by the turnpike of El Cerro to the turnpike of Jesús del Monte, which at that suburb climbs a very considerable hill, passes on to a collection of houses called Vibora, thence into the eastern valley, and again on to Rincón.

Leaving the low southern section of the city by the Calzada de Cristina, the Calzada of Jesús del Monte is reached at the intersection of the Western Railroad with that turnpike. Here the Calzada of Jesús del Monte reaches the suburb of that name, lying on the western slopes and summit of a long,

gradual hill, up which the calzada passes. This calzada is followed, for a distance of a quarter of a mile from the railroad crossing, by double tracks of the street-car line, which has its stables and terminus here.

The calzada from this intersection is a bad road, said to be impassable in wet weather, with large stones scattered over its surface, but in dry weather it is tolerable for wagons. At all times wagons could pass along the car track, paved with heavy stones between the rails; traffic can at all seasons be carried on along the tracks. Near the car stables, about midway of the suburb, a road turns northward along high ground overlooking the bay and shores in the direction of the Hill of Átares. This road ends at neighboring quarries. On the west of this side road, and nearly opposite the quarries, located in the side of a larger hill, along which the quarry road runs, lies a rounded hill well covered with soil, which commands Átares and the city and harbor of Habana. This hill is, however, small, with little room on its rounded summit, and commanded by others more distant from the city. It is not more than $2\frac{3}{4}$ miles from the Plaza de Armas and only about 200 yards from the larger hill of the quarries.

The Calzada of Jesús del Monte, after leaving the stables, becomes better; it continues up a somewhat steeper rise than before, and after reaching the summit descends toward a little settlement called Vibora. Huts and houses line the road thus far, but few extend beyond Vibora. The country on either side is rolling, well cultivated, and without timber. At Vibora, about a mile from the street-car stables, a road turns off from the calzada to the right—i. e., about west—and if continued would strike the Western Railroad at right angles, and at a point probably a mile and a half from the Calzada de Jesús del Monte and between 4 and 5 kilometers by rail from Cristina. This road stops at a private house, perhaps a mile from the calzada. Beyond this house comparatively low ground continues to the Western Railroad. The road runs along the northern slope of a high ridge or long hill, which is the Key Hill. The value of this hill as an objective in any attempt to reduce Habana can not be overestimated.

KEY HILL.

On the turnpike of Rincón and about a mile from the end of the street-car track, at Jesús del Monte, lies what is believed to be the most important strategic position near Habana. It

is called the Key Hill. The importance of this hill is due to its position in regard to Habana, to the lines of approach, and to the defenses. It occupies much the same relation to the approaches from the south and east that El Príncipe does to those from the southwest.

Except east of Morro, this hill gives a clear view seaward, and signals with ships could well be exchanged. From it all of Habana, except a little point near the ferry, to Regla is exposed, even to Chorrera, though that place is partly hidden by the hill of Príncipe. It overlooks the houses of Jesús del Monte and completely commands the two hills indicated nearer that place, which are themselves strong positions. It gives a clear view of the entire city, and is distant from the Plaza de Armas about $3\frac{1}{2}$ (possibly 4) miles in a direct line. It commands and gives a clear view of Cabaña and most of the bay, commands the Cerro and the line of the Western Railroad completely. El Príncipe, clearly in view, is about 2 or $2\frac{1}{2}$ miles distant. The highest portion of the ridge commands Habana, part of Regla, El Príncipe at a long distance, Átares, Cabaña, Morro, a part of Jesús del Monte, and all of the south shore of the bay, including magazines. The line of the Habana Railroad is covered, but El Cerro is exposed. Near Guanabacoa is seen a high hill, probably La Loma de la Cruz.

The Key Hill is a long ridge whose axis, running sensibly east and west, is about 800 feet long. The crest is estimated to be about 200 feet above the sea, appearing slightly higher than El Príncipe. The highest point of the ridge lies about 200 yards from the turnpike, which cuts the eastern flank, where the slope is steepest. The slope northward, which overlooks Habana, is next in steepness, but readily surmountable by wagons. From the south and southwest—i. e., in the rear, if facing Habana—the slope is gentle. Wagons and artillery could readily be brought up to the crest. Toward the west, where lies the railroad, the Key Hill runs out into a long ridge, which is near the house mentioned, and disappears in low ground lying immediately along the line of the Western Railroad. A small ridge extends to the railroad, which continues on through cuts. Farther to the west of this lies another low ridge, covered with palm trees, which interferes between the cut and the line of view from El Príncipe. The turnpike cuts through the right flank, but below the crest

and the little cluster of houses there, which is the beginning of Jesús del Monte, it is hidden. The surface is grass covered, and with sufficient soil for earthworks, but the soil is not more than 4 feet thick, and loose stones are frequent. It has been plowed and is without trees.

To the eastward of the Key Hill are three others, the nearest of which would be dangerous if occupied by an enemy, but this should be fortified at the same time as the main position, as well as the two smaller hills to the eastward. All four form a chain nearly a mile long, but on account of the intervening valleys the line necessarily occupied would be much shorter. The crest of the Key Hill from the calzada down the long regular slope of its ridge to the railroad is probably about 800 yards in length. The prolongation of the ridge would strike the railroad near a small culvert, which lies about midway between the 3 and 4 kilometer posts. The 4-kilometer post is near the beginning of the cut through the ridge lying in front of the Key Hill; this ridge is low, and a curve in the cut completely shuts Átares from view. From there southward the railroad seems completely protected from its fortifications about Habana. At about 4 kilometers of the railroad the Calzada of Palatino reaches the track, and, without crossing, follows it for nearly a mile, then turning to the west goes on to Vento. From near the 5-kilometer post to near the 4-kilometer post the new aqueduct lies within 30 feet of the railroad; then the latter turns westward to the new reservoir, placed as described.

The Key Hill can not be enfiladed nor commanded. A hill toward the east more nearly fulfills these conditions than any other position, but that is too far to the north to enfilade completely. The right (east) flank of a work on the Key Hill would be somewhat exposed, but a parapet on that flank would greatly decrease if not obviate that difficulty; and the Key Hill is slightly higher than that to the right. The latter is probably 1,000 yards away. It is rounded and clear, but not occupied by houses. The axis of the ridge is approximately at right angles to the line of fire from El Príncipe, about $2\frac{1}{2}$ miles distant, and nearly so to the line of fire from Átares, about $1\frac{1}{2}$ miles distant.

The Key Hill is slightly superior in command to El Príncipe, and very considerably superior to all the other permanent works of Habana. More than that, there does not appear to

be an available position dominating the hill unless it be La Loma de la Cruz, near Guanabacoa. To the south, along the line of approach from Rincón by Western Railroad or by calzada, no height is to be seen from which an enemy could annoy a force occupying the ridge. Thus nothing in the rear nor on either flank would command field batteries placed on the Key Hill, with the possible exception of the hill to the east, 1,000 yards away, which should be occupied. The valley between these hills is neither deep nor broad; through it passes the turnpike to Rincón, cutting through the side of the Key Hill.

Let us suppose an advance from Rincón by the line of the Western Railway.

As far as Los Pinos, about $9\frac{1}{2}$ miles from Rincón, the railroad winds among hills, but from Los Pinos to Habana it is nearly straight. Near that station it makes a curve, running over an embankment for about $1\frac{1}{2}$ miles to the small cut mentioned as passing through the western flank of the Key Hill. From this cut, following the ridge, the position is perhaps a little more than 1 mile in length; the distance to the turnpike along the ridge about 800 yards.

This hill seems designated by nature as the key to the defense of Habana. It was never utilized by the English, because they probably knew nothing of its existence. In 1762 the country westward from Guanabacoa was heavily wooded.

REGLA.

Regla is a portion of Habana, lying on the eastern shore of the bay, here about half a mile wide. It has two ferry slips, good warehouses, gas works, and railway stations of the Bay road and of the dummy line to Guanabacoa. It lies on low ground and is exposed very generally to fire from the works and positions about Habana. A good road goes to Guanabacoa, which lies considerably above Regla and about $2\frac{1}{2}$ miles distant.

GUANABACOA.

The largest town in the vicinity of Habana, has perhaps 20,000 inhabitants, and occupies high ground to the east, about 3 miles away, and in sight of the latter city. The town is old, dirty, but with good water. Houses chiefly of stone; streets roughly paved. Near by are several commanding hills, the most important being a hill between Guanabacoa and Regla, about a mile from the latter place, probably

called La Cruz. Here the English placed their guns after capturing Guanabacoa, but, it is said, could not reach the city, about 2 miles away.

This is an important position in the event of an attack from the north coast or of an advance from the eastward. It would probably be occupied by the field works of defenders, and would be the most threatening to the Key Hill of all the positions about Habana.

From Guanabacoa to Cojimar the turnpike already described leads to that village.

COJIMAR.

Cojimar is a suburb placed on a little inlet of the north coast and about $3\frac{1}{2}$ miles east of the city. It is of small consequence in itself, being merely a summer resort for the people of Habana and Guanabacoa. One end of the cable to Key West lands here. The inlet is deep and affords a good place for a boat landing. Here and to the eastward the English landed in 1762, subsequently making a flank attack from Chorrera, which resulted in the fall of Habana. From Cojimar the shore road already described leads to the east shore of Habana Bay.

PROVINCE OF PINAR DEL RÍO.

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ARTEMISA.

35 BAHÍA HONDA.

PROVINCE OF PINAR DEL RÍO.

LOCATION AND BOUNDARY.

The province of Pinar del Río is situated at the western extremity of the Island of Cuba. It is bounded on the north by the Gulf of Mexico, on the east by the province of Habana, on the south by the Sea of the Antilles, and on the west by the Strait of Yucatan.

AREA AND POPULATION.

The area comprises 4,609 square miles; the length of the province is 160 miles, the width 50 miles. The population is 226,000, divided among Spaniards, native Cubans, negroes, and "mezclados"—those of mixed blood. These occupy one city, four towns, twenty-two villages, one hundred and fifty hamlets, and six thousand suburbs.

ADMINISTRATION.

Previous to the Spanish-American war, Pinar del Río was a third-class province, with a civil governor under a general governor or military commander. It has, like the other provinces, its own judicature of finance and special charge of roads and communications.

The people elect their deputies of districts and mayors of cities. There are courts of justice, municipal and ecclesiastical courts. The province has two vicars and twenty-five parishes.

Pinar del Río constitutes with Habana the western territorial region and court of justice. The courts of first instance or inquiry are Pinar del Río, Guane, San Cristóbal, and Guanajay. The municipal courts are Pinar del Río, Alonso Rojas, Consolación del Norte, Consolación del Sur, San Luís, Viñales, Guane, Baja, Mantua, San Juan of Martínez, San Cristóbal, Candelaria, Mangas, Palacios, Paso Real de San Diego, San Diego de los Baños, Santa Cruz de los Pinos, Guanajay, Artemisa, Bahía Honda, Cabaños, Mariel Banes, Cayajabos, Guayabal, and San Diego de Muñoz.

This province forms with Habana one of the military commands, having a captain of the harbor, with adjutants of the navy.

The judicial districts are Pinar del Río, with six townships; Guanajay, with eight; San Cristóbal, with seven; and Guane, with four townships. The principal cities are Pinar del Río, Guane, San Juan y Martínez, Consolación del Sur, Bahía Honda, Guanajay, and Artemisa.

PUBLIC INSTRUCTION.

The educational system of the entire island is under the direction of the governor general and the rector of the University of Habana, all schools being subject to the Roman Catholic Church. In Pinar del Río there is 1 institute with 145 students, 46 private schools; and 144 public schools, with an attendance of 3,565 students. The course of instruction in all schools is closely allied to the religion; history and the "credo" (creed), etc., go hand in hand. The sexes are always separated. Pedagogy is understood very superficially. The Cubans are little addicted to study, although the frequent presence of bookstores indicates a fondness for reading; newspapers, being under a strict censorship, are narrow and uninteresting.

AGRICULTURE, INDUSTRY, AND COMMERCE.

Tobacco is the main product of the province, and is of finer quality here than in any part of the world. Sugar cane, coffee, rice, and corn are cultivated on a large scale, while vegetables and fruit are abundant. Sea island cotton grows on the low coasts, whilst the highlands produce rich woods. Stock farms are not unfrequent.

The chief industry is the manufacture of tobacco, yet there are extensive lumber and mining interests (especially copper mining). Stock raising and fishing give occupation to many of the people.

Commerce with the United States is considerable, and consists in the exportation of manufactured tobacco, fine woods, iron ore, and some fruit, and the importation of flour, petroleum, etc. The province of Pinar del Río has especial advantages, by reason of numerous ways of communication, both by land and water. Its railroads, turnpikes, and various lines of steamships facilitate commercial relations both at home and abroad.

GEOGRAPHY AND TOPOGRAPHY.

The northern and western portions of the province are mountainous; the coasts generally low and marshy. In the center of the province is the garden spot of the entire island, "The Vuelta Abajo," celebrated for its fertility. This region is thickly populated, and the people more prosperous than elsewhere in all the island.

The largest ranges occupy the greater part of the western and northern sections of the province; the coasts are usually low and marshy; moor wastes, salty marshes, and shoals are common in the low lands. There are no active volcanoes in the mountain ranges, but wonderful caves and subterraneous cavities are characteristic. Rivers and lakes are numerous, although the lakes are usually insignificant, and are but mere quagmires and little known. A few larger ones are formed by the tide; of these Guadiana, Lacato, Cortes, and Guto are the most important. Some canals form connecting links, such as Buenavista, Romadero, Cayo, Lerisa, and Alacranes in the north; Las Cayamas in the south. Following are the principal mountain groups and ranges: Guaniguanico, Sierra de los Órganos, Acosta, Agicoual, Infierno, Matahambre Rosario, Guacasnayas, Guao, Caiguanabo, Arcos, Guera, Calaljana, El Abra, Linares, Limones, Cacarajicara, and Rangel; Cuchillas de San Sebastian and de Gavilanes; Hills of Guane or Cuyoguateje, Mantezuelos, and Cabras; Pan de Azúcar or Pico de Garrida, Pan de Guajaiban, Lomas de Gramales, Calunta Rabo, Aguacate, Brujo, Peña Blanca, Campanarios, Brujitos, Buenavista, Jacair, Juan Ganga, Cuzco, Barrabas, Magote, Manantiales, Rubin, Pelada, Gobernadora and Jobo, Sierra de las Perdizes, Group of Marien, Sierra de Anafe or Mesa del Mariel, Lomas de la Vigia, and Esperón. The ridge Cordillera de los Órganos culminates in the Pan de Guajaibon, 2,000 feet high, broadening till it reaches the terminating peak Cerro de Cabra.

Among the valuable mineral springs, that of San Diego is most celebrated. The extensive archipelago of Guaneguanico borders the northwestern shore.

RIVERS.

The rivers are not long, but in the wet season of considerable volume; only a few of them are navigable. The main rivers are:

The Guanés or Guadiana River, emptying into the northeast part of the bay. On the northern shore is Geronimo

Point, off which a reef extends $\frac{1}{4}$ mile to the southeast. The river has a depth of about 7 feet, but is so narrow and crooked that boats only can navigate it. The towns of Guane and Paso Real export from here.

Mantua rises in the Sierra de Acosta and empties on the western coast.

Buenavista rises in the Sierra de Acosta and empties in the ocean opposite of bay of the same name.

Baja rises in the Sierra de Acosta, flows through the town of Baja, and empties into the bay of the same name on the north.

Aguas rises in the Sierra de los Órganos and empties in the Santa Lucia Bay on the north.

Rosario rises in the Sierra de los Órganos and empties in the bay of Rosario on the north.

Rio Hondo rises in the Sierra del Rosario and empties in the Bahía Honda, flowing through the city of the same name.

Cabañas, a short stream rising in the mountains south of the port of that name, empties in the port of Cabañas.

The principal rivers on the south are:

The Cayaguanteje, rising in the Sierra de Acosta and emptying in the bay of Cortes.

San Sebastian, rising in the Sebastian mountains and emptying into the bay of Coloma on the south.

Pinar del Río rises in the Sierra del Infierno and flows through the city of Pinar del Río, emptying into the bay of Coloma.

Herradura rises near the town of the same name, flows south through a rich tobacco region, and empties into the bay of Dayaniguas.

Los Palacios rises near the town of the same name, flows south, and enters the ocean between Punta Cornegalos and Punta de Adento.

Sabana rises in the hills north of San Cristóbal, flows south, emptying near Punta de Adentro.

Majana rises in the mountains near Cayajabos, flows south through the Vuelta Abajo, and empties near Punta Nombre.

The smaller rivers are Guadiana, Salado, Santa Lucia or Malas Aguas, Pan de Azúcar, Santiago, Dominica, Mosquito, Banes, San Marcos, Manatí, Blanco, which empty into the Gulf at the north; and Bayato, Lacana la Mar, Bacunagua, San Diego, Coloma, San Juan y Martínez, and Galafre, which flow into the Sea of the Antilles at the south.

A peculiar feature of some of the rivers is that, while seeming to flow into lakes, they actually drain them, and frequently disappear altogether. A peculiar phenomenon is seen where they thus disappear, and farther on reappear in successive cascades.

The San Diego River passes under marvelous natural bridges of great altitude; other rivers plunge into caves and are lost to view.

COAST LINE.

The outline of the coast is both high and bold, and low and marshy. Portions of it are sheltered by archipelagoes, or screened by shoals, reefs or islands, making navigation difficult. Where the coast is high, there are fine harbors. The coasts are alternately intersected by cliffs and marshes.

POINTS AND CAPES.

The principal points on the north are:

COLORADA POINT.—From Algodonar Point the coast forming a bay trends NW. by N. $3\frac{1}{2}$ miles to Colorado Point, from which a sand bank extends $\frac{3}{4}$ mile westward. NW. $3\frac{1}{2}$ miles from Colorado Point is Pinalillo Point, projecting into the bay of Garanacha. In this space the coast is a little elevated and covered with pine trees.

SANTA LUCIA POINT.—From the north Point of Jutias Cay its shore and the mainland run SE. 3 miles to the head of a shallow bay; thence it trends NE. $\frac{1}{2}$ N. for 6 miles to Santa Lucia Point. Two miles farther on is the western point of Malas Aguas Bay.

CAPE SAN ANTONIO, projecting from the west end of Cuba, is low, covered with trees from 70 to 80 feet high, which are seen before the land, and often appear like vessels under sail; the shore is intersected alternately by soboruco cliffs and sandy beaches. The extreme end of the island bends round so gradually for about 4 miles that it is difficult to make out any projecting point, so that the cape can only be recognized by the lighthouse on the sandy beach. Near Perpetua Point a bank commences, which sweeps around the west end of the island about a mile off shore, and joins the Colorados Reef to the northward of the cape. On the edge of the bank there are from 18 to 23 fathoms water, rocky bottom.

Light.—The lighthouse on Cape San Antonio exhibits, 128 feet above the sea, a white light revolving every half minute,

which should be visible 17 miles. A boat can easily land under the lighthouse at a small breakwater extending from the sandy beach. Reported irregular.

CARAVELA CHICA AND GRANDE POINTS.—From Caravela Chica Point the coast trends about NE. $3\frac{1}{2}$ miles to Caravela Grande Point; thence forming several bays $6\frac{1}{2}$ miles to the western extremity of Plumajes Point. Half a mile northward of Caravela Chica Point there are several rocky heads, with 3 feet water on them; but thence as far as Plumajes Point there are no dangers, and the bottom is mud.

PLUMAJES POINT is a bluff. Although not high as compared with the land in its vicinity, it is easily distinguished. From the eastern end a reef extends $\frac{3}{4}$ mile to the N. 70° E. (N. 66° E. mag.), and rocky ground extends 2 miles farther in the same direction.

TOLETE POINT.—Six miles eastward of Plumajes Point is Tolete Point, and $4\frac{1}{2}$ miles farther is Guadiana Point, the land between forming a bay a mile deep, with $2\frac{1}{4}$ fathoms water.

SAN FRANCISCO.—Pinalillo Point is foul, and $4\frac{1}{2}$ miles NW. of it is Avalos Point, which is a narrow tongue of land projecting seaward more than a mile. There is anchorage under its lee sufficiently clear of danger during the season of northerly winds. Between the two points is a bay 2 miles deep, where there is an inlet, and within which is the loading place of San Francisco.

GOBERNADORA POINT.—From abreast Blanco Cay the coast trends $7\frac{1}{2}$ miles NE. $\frac{3}{4}$ E. to the mouth of the Manimani River; thence with little elevation 3 miles E. $\frac{1}{2}$ N. to Gobernadora Point.

BLANCO AND MANIMAR PASSES.—The Blanco Pass is $1\frac{1}{2}$ fathoms deep and runs in about a SE. by S. direction. From this pass the reef trends about NE. by E. 5 miles to Manimar Pass, where small vessels of 5 feet draft can enter; thence the reef runs a little more northerly, about $1\frac{1}{2}$ miles from the coast, to Gobernadora Point, from which it extends off about a mile, and then trending nearer the coast, terminates in the reef off Pescadores Point, at the west side of entrance to Bahia Honda.

Directions.—Vessels of 7 feet draft can navigate within the reefs, but with any sea the Alacranes Pass is somewhat dangerous; it will therefore be better to take Galera Pass. In passing near Diego and Rapado Cays, care should be taken to avoid the banks in their vicinity. A vessel may pass east

or west of the bank lying NW. of Buena Vista Cay. Near the reef the bottom is rocky, and many isolated heads are met with, but near the coast it is sand and mud. There are several detached patches of 3 fathoms in the large opening between the Colorados and Cajon Point, and nearly in mid-channel lies a bank 5 miles in length, with only 2 fathoms water on its shoalest part. These can generally be avoided by the eye, the chart giving their positions.

The principal capes and points on the south are as follows:

HOLANDÉS POINT, 15 miles from Cape Corrientes, is the western extremity of the bay of the latter name. The water is discolored for about a mile off the point. For 3 miles on either side of the point the shore is bounded by a rocky cliff about 35 feet high, and at the extremity of the point there is a remarkable red spot. From the east end of the cliff a reef extends off shore about 300 yards as far as this red spot, and the depths are from 14 to 20 fathoms $\frac{1}{2}$ mile outside it. From Holandés Point the coast trends about W. by N. 7 miles to Perpetua Point. Between is Piedras Point, off which a reef extends about 600 yards. Perpetua Point lies about 3 miles SE. by S. of Cape San Antonio, and on it is a fisherman's hut.

CAPE CORRIENTES is a low sandy point, with the ruins of a stone wall a short distance within it, at the edge of the low trees which cover the land in the interior. There are a few small dry rocks about 50 yards from the point, and a shallow rocky spit runs off $\frac{1}{4}$ mile SW. of them. Two-thirds of a mile off shore the depth is 5 fathoms. This point has been mistaken by strangers for Cape San Antonio, from the land of Cuba appearing to terminate here, on account of the deep bight of Corrientes westward of it; but the lighthouse on Cape San Antonio clearly marks the distinction; besides, as Corrientes is approached, should the weather be clear, the distant mountain ranges of Organos and Rosario may be seen to the northward.

REEFS, BANKS, AND CAYS.

The principal reefs, banks, and cays of the province of Pinar del Rio on the north are as follows:

COLORADOS REEFS.—This great extent of coast is skirted nearly the whole way by dangerous broken reefs, called the Colorados, leaving shallow water within, navigable between the cays and numerous heads of rocks for coasters drawing 10

or 11 feet water, which find an entrance near Cape San Antonio and through some intricate channels to the NE. The outer limits of these great barrier reefs are but imperfectly defined, and should therefore be approached with the utmost caution, for the lead will give scarcely any warning, and the sea on the shoals seldom breaks. The land at the SW. part of this shore is so low as to be out of sight from the edge of the reef, and the current in the immediate vicinity is strong and extremely variable.

The edge of the bank, which passes a mile westward of Cape San Antonio, runs about N. by E. for 7 miles, with from 4 to $2\frac{1}{2}$ fathoms water on it, sand and rock; then NE. by E. $3\frac{1}{2}$ miles, where there is a detached 3-fathom patch, nearly a mile outside the edge of the reef, on which there is from 3 to 5 fathoms water; thence it trends more to the NE. and eastward, skirting about a mile off the reefs with 4 to 8 fathoms water on it as far as Bahia Honda.

Nearly 15 miles N. 32° E. (N. 28° E. mag.) of Cajon Point lies the SW. extreme of these extensive reefs; thence running NE. by N. for 24 miles to Buena Vista Pass. The reefs are here 3 miles in breadth in the middle part and 2 elsewhere.

The outer edge of the reef at Buena Vista Pass appears to be about 5 or 6 miles from the west end of the cay of the same name, the first islet met with coming from the SW., and which may be seen 12 miles. From this pass the line of reefs continues to the NE. for about 45 miles, and then trends more easterly until it almost joins the shore westward of Bahia Honda. These remarks are intended merely as a general description of the limits, and by no means to direct a vessel along the edge of these dangers.

LEÑA OR MANGLES CAYS, a group of four small islets, are low and covered with mangrove trees. They are separated from each other by narrow channels, shallow at the entrance but deep inside. The largest of these cays, called Punta de Afuera, is low and marshy. It is separated from the coast by a bay, nearly landlocked, being protected to the eastward by a salient point. This point forms, with the eastern end of Punta de Afuera Cay, the Barcos Channel, where vessels drawing not more than 15 feet may find sheltered anchorage.

BARCOS CHANNEL.—The points at the entrance lie east and west of each other, a small reef extending from each, so as to leave a clear channel 200 yards wide, with a depth of 2

fathoms, muddy bottom, at the entrance. Inside, the channel deepens to $4\frac{1}{2}$ fathoms, widening at the same place to 500 yards, again narrowing and shoaling as a small submerged cay is approached.

This small cay forms a channel about 6 feet deep, by which small vessels may reach the bay above mentioned. To enter it, a sailing vessel needs a fair wind, but the entrance has no danger, and inside a vessel may anchor as convenient, there being 5 fathoms of water close to the mangroves.

There are several small cays, having only boat channels between them, in the bay to which the Barcos Channel leads.

The general depth is from 6 to 9 feet.

REBELLINES CAYS.—To the westward of Afuera Cay are three other small mangrove cays, the northern and smallest of which is called Leña Cay, the other the Rebellines. The latter, lying about $\frac{1}{4}$ mile off the coast, has a small reef running off the southern side.

BUENA VISTA CAY, separated from the coast by a channel about a mile wide, is the largest of all those on this part of the coast. This cay is 5 miles in length east and west, and 1 mile in breadth; it is low and marshy, and divided in the middle by an inlet navigable by boats. From its NW. point a mud bank extends off 200 yards, and near the western point there are 6 feet water. A small cay lies off the former point with a passage between for boats and also another small cay, named Abra, off its north side.

One mile NW. of the cay is a bank about 7 miles in length NE. by N. and SW. by S. and 1 mile in breadth, with about 5 feet water on it; but there are passages between it and the reefs.

Buena Vista Pass has only 2 fathoms of water in some places, and is only 200 yards wide. From this pass to that of Roncadora the reef is not less than 1 mile wide.

RAPADO CAY is 3 miles in length NE. by N. and SW. by S., and partly marshy, with mangroves. A reef extends about 600 yards from its northern part, with $1\frac{1}{2}$ fathoms water on it; and a similar reef projects 400 yards NW. from the western point. The distance from this cay to the coast is 3 miles, where the landing place named Canas is situated, and which is south of the cay. The passage between the cay and the coast is only navigable for small coasting vessels of about 4 feet draft.

Two miles westward of the west point of this cay lies a rocky bank with $5\frac{1}{2}$ feet water on it, named Vinagera. To the SW. and near the cay are two small cays, named Toro and Vaca.

To the NE. by E. of Rapado Cay, over a space of 6 miles, lie four banks of sand and mud with scarcely a fathom water on them. There are passages between the extremities of the shoals and Rapado and Diego Cays, but small vessels only can pass between the banks. The passage between the banks and Rapado Cay is a mile wide and of moderate depth; that between the banks and Diego Cay is the same in breadth, and from $1\frac{1}{2}$ to $2\frac{1}{2}$ fathoms deep; mud bottom. These passages are useful in proceeding to the bay and loading place of Santa Rosa.

RAPADO CHICO CAYS.—Half a mile southward of Rapado Cay is the northern of the Rapado Chico, a group of four extending north and south 2 miles. The passage between the latter cays and Rapado is $1\frac{1}{2}$ to $1\frac{3}{4}$ fathoms deep, and leads to the loading places of Santa Isabel and Canas. The channel between the southern Rapado Chico and Buena Vista is $1\frac{1}{2}$ to $1\frac{3}{4}$ fathoms deep, clear of danger, and 2 miles in breadth.

RAPADO.—From Buena Vista Pass the reef trends NE. 10 miles to Rapado Pass. This channel lies NW. by W. $2\frac{1}{2}$ miles from the north end of Rapado Cay, and the least depth is $2\frac{1}{2}$ fathoms; rocky bottom.

CANAS AND SANTA ISABEL.—From the Buena Vista River the coast runs about NE. by N. 4 miles to the north point of the loading place of Santa Isabel, and thence with some sinuosities about N. by E. 3 miles to the point north of the loading place of Canas, when it trends to the eastward 2 miles to the head of Santa Rosa Bay.

SANTA ROSA BAY AND DIEGO CAY.—From the head of Santa Rosa Bay the coast runs about NNE. $6\frac{1}{2}$ miles to Tabaco Point. Three miles from Tabaco Point and $1\frac{1}{2}$ miles from the coast lies Diego Cay, which is $1\frac{1}{2}$ miles in length east and west, and a mile in breadth. From its north end a reef extends $\frac{3}{4}$ mile to the NW., and then trends as far and around Tabaco Point to the western point of Baja Bay. This reef is of rock, and has less than one fathom water on it. To the ENE. of Diego and near the coast are two small marshy cays named Eslabones, and eastward of these two others at a distance of 600 or 800 yards, the larger

of which forms Tabaco Point, and the smaller, at 200 yards ESE. of it, is separated by a narrow channel.

DIEGO AND RONCADORA PASSES.—From Rapado Pass the reef runs NE. by E. $3\frac{1}{4}$ miles to the first of the Diego Passes, and after forming the second 2 miles further to windward, continues NE. 4 miles to Roncadora Pass. The two passes of Diego are $1\frac{1}{2}$ fathoms deep; the weather one lies 3 miles from Diego Cay, and the lee one $2\frac{1}{2}$ miles. The Roncadora Pass is a mile in breadth and $2\frac{1}{2}$ fathoms deep. To enter it, coast along the edge of the reef until the town of Baja, on rising ground 2 miles inland, is in sight, then bringing the tower of the church on with the little hill of Acostas; this mark will lead through mid-channel with depths of from 16 to 26 feet after passing the reef.

BANK OF THE JARDINES AND JARDINILLOS.—The NE. part of the reef which encircles the great bank and cays of the Jardines commences southeastward of Diego Perez Cay, and running to the SE. forms an inward curve at the Médano Vizcaino Cay, and thence continues to the eastern cay of the bank; this side of the bank is steep-to, studded with rocks and small patches of sand just awash, with no opening. The mariner is again warned that the current in the Gulf of Cazones is uncertain, both in strength and direction, and he can not be too cautious.

EAST GUANO CAY is of soboruco, about 40 feet high, the east end covered with grass, dwarf cactus, and shrubs; elsewhere the ground is rough, with deep pits from the excavations for guano. A small rock lies about 200 yards from the east end of the cay, and shallow uneven ground extends $\frac{1}{2}$ mile N. 71° E. (N. 67° E. mag.) from it. The bank, about 5 miles in breadth, extends in an ESE. direction from the cay, and terminates about 11 miles from it, where there are 14 fathoms water. From this depth the soundings gradually decrease toward the cay, with a bottom of coral, sand, and weed.

From East Guano Cay the edge of the Jardines Bank runs to the westward for 12 miles to Trabuco Cay. Thence the cays continue to Largo Cay, 13 miles to the westward, and are generally of rock, high and steep, and lie near the edge of the bank, which is skirted by a chain of reefs.

LARGO CAY, 12 miles in length, is the most eastern of the Jardines, which name comprises all the cays between it and

Isle of Pines. It is uniform, about 50 feet high, thickly wooded, and on its south side is a sandy shore, bordered by a reef which at its east end extends more than a mile off. About 5 miles S. 15° W. (S. 11° W. mag.) of the NE. point lies a dangerous reef about 3 miles from the shore, and just within the edge of the bank, on which the sea breaks. The reef which skirts the south side of this cay runs about W. by S. for 12 miles, and then trends to the southward for about 6 miles, forming a spit nearly 2 miles wide, at the outer extreme of which is supposed to lie Jack Taylor Shoal. From the northern end of the spit the main reef continues to the westward for 5 miles, as far as Rosario Channel, with deep water close to the southward of it.

On the above reef are the two small rocky Ballenatos Cays, barren, white, and about the same height. They are about 3 miles apart, and the eastern one lies about a mile from the west end of Largo Cay. There is said to be anchorage in 7 to 10 fathoms water northward of them.

Between East Guano Cay and Rosario Channel the bank does not extend more than between 1 and 2 miles southward of the cays (except at the Jack Taylor Reef), with 16 to 13 fathoms water, rocky bottom, and the soundings diminish rapidly to the reef.

JACK TAYLOR REEF.—Several positions have been assigned to this dangerous shoal. Commander H. D. Grant, of H. M. S. *Steady*, in April, 1863, fixed the position of the reef in latitude $21^{\circ} 28' 00''$ N., and longitude $81^{\circ} 47' 30''$ W. From $12\frac{1}{2}$ fathoms water, coral, and sand, the soundings decrease regularly to the reef, which is of coral. From the masthead the white water may be seen running in like a spit until it joins the main bank. The Caiman fishermen say there are 5 and 6 fathoms water all over this spit.

ROSARIO CAY, when first seen from the southward, has the appearance of three small islands, the largest being in the center. As it is approached some sand cliffs will be observed, by which it will be known from those in the immediate neighborhood. The shore of Largo Cay on the east, and that of Cantiles Cays to the west, are wooded.

CAY SABINAL.—The shore is very low and sandy, backed by numerous lagoons and swamps, and skirted by a broken reef to the distance of from 1 to $1\frac{1}{2}$ miles, with soundings about $\frac{1}{2}$ mile outside of it.

ANTONIO KNOLL is a coral bank, about $2\frac{1}{2}$ miles in length and 2 miles broad, with a general depth of 14 and 16 fathoms. One spot, on which only 10 fathoms were found, lies N. 24° W. (N. 28° W. mag.) about 10 miles from Cape San Antonio light, and its center is 4 miles from the edge of the Colorados Bank; discolored water may be seen over it in clear weather. About 11 miles N. 15° W. (N. 19° W. mag.) of the light is another patch of 10 fathoms. In 1887 soundings of $3\frac{1}{4}$ to 7 fathoms were obtained on the knoll with the light-house bearing S. 18° E. (S. 22° E. mag.), distant from 11 to 12 miles.

Although several shoals have been reported in the vicinity, it is evident from the examinations made by the U. S. S. *Talapoosa* in 1883 and the U. S. Fish Commission steamer *Albatross* in 1884 that there is no danger to navigation outside of the Colorados Reefs, the discolored water seen over the Antonio Knoll doubtless being the only ground for supposing that any shoal existed.

JUTIAS CAY is nearly 3 miles east and west, and 12 in circumference; the northern part of it is firm land, but the southern is marshy; at its western end there is a fisherman's hut. It is separated from the coast by a channel about 200 yards in breadth, navigable only with difficulty by boats and canoes.

GULFS, BAYS, AND ANCHORAGES.

The following are the principal gulfs, bays, and anchorages of the province of Pinar del Río on the north:

GARANACHA BAY, although exposed to westerly winds, affords good anchorage, gales of wind from that quarter rarely blowing. The holding ground is good, the bottom being muddy. In the center of the bay, $1\frac{1}{2}$ miles off shore, there is a depth of $1\frac{1}{2}$ fathoms at high water. There are only 6 feet of water at low tide 400 yards off shore, so that lighters can not reach the landing place at that time. On the shore is a small beach, with roads leading from it toward the towns of Mantua, Guane, and Pinar del Río.

During the rainy season water may be had from a lagoon near the beach; in the dry season it is procured from the Santa Lucia River, which empties into the bay.

GUADIANA BAY.—Three-quarters of a mile north of Guadiana Point is Algodonar Point, forming between them the entrance to Guadiana Bay. From these points the coast runs

eastward on either side for $\frac{3}{4}$ mile, forming a channel $\frac{1}{2}$ mile in breadth, which is narrowed by mud banks having about $1\frac{1}{2}$ fathoms water on them, which extend off on either side for 200 to 400 yards.

The navigable channel varies from 200 to 400 yards in breadth, and carries about $3\frac{1}{2}$ fathoms water, as far as the entrance to an inner bay, which runs to the NE. The outer bay is nearly circular and 4 miles in extent, and when in the fairway channel there are $2\frac{1}{2}$ fathoms water. Being in the center of the bay and anchored in the middle of the passage, in $2\frac{1}{2}$ fathoms, southward of a small beach, a vessel will be sheltered from all winds. On the beach there is a lagoon with fresh water.

MULATA BAY.—About a mile SW. from Blanco Cay is the point and river of Medio, and a mile farther to the southward the bay and loading place of Mulata.

MALAS AGUAS BAY is about 2 miles across at the entrance, and $1\frac{1}{2}$ miles deep. From its eastern point the coast trends about E. by S. $2\frac{1}{4}$ miles to the mouth of the Azúcar River, where $\frac{1}{2}$ mile up is good fresh water and the best found anywhere within the reefs.

About $1\frac{1}{4}$ miles NW. of the mouth of the river is the small Cay Boquerones, separated from the weather point of the bay by a channel $1\frac{1}{4}$ fathoms deep, but in navigating it a pilot is necessary, as the shore is bordered by reefs.

BAJA BAY is a secure anchorage, being only open to NW. winds. In this direction the reefs are at no great distance and prevent any heavy seas from rolling in. At the head of the bay there is a landing place, serving as a port for the town of Baja, about 3 miles inland. Vessels of light draft lie $\frac{1}{2}$ mile off the landing in 8 feet of water.

On the south:

MAJANA BAY AND SABANA-LA-MAR.—From Cayamas Point the shore takes a W. $\frac{1}{2}$ N. direction for 9 miles, when it trends to the SW. for 8 miles to Salinas Point, forming Majana Bay. The Guanima River empties itself westward of Cayamas Point, and about here the marshes terminate. From Salinas Point the coast trends SW. 6 miles to Capitana Point, and then about SSW. 4 miles to the small creek of Sabana-la-mar, which affords shelter to droghers, near the mouth of the Cristobal River.

CORTES BAY.—From the mouth of the Galafre the coast trends SSW. 7 miles to the entrance of the Cuyaguatega River. About 4 miles southward of the latter are four small cays, which extend $2\frac{1}{2}$ miles in a southerly direction, covering the mouth of a deep bay, called the Laguna de Cortés. In this lagoon there are $2\frac{1}{2}$ fathoms water, but at the narrow entrances formed by the cays there are only 6 feet. Turtle are found on the cays. Piedras Point, which is on the parallel of San Felipe Cays and distant from them about 19 miles, is the termination of Cortes Bay, where there are from 3 to $3\frac{1}{2}$ fathoms water over weeds.

CORRIENTES BAY.—About 3 miles northward of Cape Corrientes there is a remarkable rocky cliff, called Caiman Bluff. Thence the shore trends northerly, curving eastward, for 7 miles, and then turns abruptly to the westward. The bluff is of soboruco, steep, and higher than any other part of the coast of the bay; to the northward of the cliff a small vessel may anchor in 5 fathoms water, close to the sandy beach, by carrying a hawser to the shore. This is the only anchoring place in the bay which affords shelter from the strong SE. winds. Elsewhere there is no bank, the shore is low, steep, and covered with trees.

At the head of the bay, about 6 yards from the shore, there is a spring of fresh water, which rises in bubbles to the surface of the sea. Ten miles WSW. of the head of the bight is a remarkable piece of scarped land forming a cliff of soboruco at a short distance from the beach, called Balcones; thence the shore trends SW. 8 miles to Holandés Point.

TEMPORARY ANCHORAGE will be found under the west end of Cuba, with the north extreme of the land bearing N. 23° E. (N. 19° E. mag.) and the south extreme bearing S. 45° E. (S. 49° E. mag.). This anchorage must be approached carefully, as it shoals quickly and the bottom is foul.

Lieutenant Pillsbury, U. S. Navy, considers the following to be a better temporary anchorage, and reports: "I anchored in 10 or 11 fathoms, sandy bottom, and no coral heads, the light bearing N. 56° E. (N. 52° E. mag.). A coral reef extends about a mile off shore, its outer end bearing north (N. 4° W. mag.) from the anchorage, about $\frac{1}{2}$ mile distant."

Besides those mentioned there are a number of small bays which are not deemed of enough importance to describe. They are Picado Bay, Santa Lucia, Rosario bays on the north;

Turtuga Bay off the San Felipe Cays, and Dayanguas Bay on the south. The bays of Bahia Honda, Cabañas, and Mariel will be fully described under the general description of the towns of those names.

Tortugilla, Curces and Caravelas are anchorages for vessels not exceeding 9 feet draft.

RAILROADS.

This province has some 91 miles of trackage, distributed as follows:

1. From Habana to Guanajay, 35 miles, 2 of which are in the Province of Pinar del Río, single track, standard gauge, belonging to the Ferrocarriles Unidos, an English syndicate.
2. From Habana to Pinar del Río, 113 miles, 74 of which are in Pinar del Río Province, single track, standard gauge, belonging to the Ferrocarril Occidente, an English syndicate.
3. From Vinales to Muelle, 15 miles, standard gauge, single track, connecting Vinales with the coast.

1. HABANA-GUANAJAY RAILWAY.

[For Table of Distances and Itinerary of this road see under Province of Habana, "2. Habana-Guanajay Railway," page 213.]

2. HABANA-PINAR DEL RÍO RAILWAY.

TABLE OF DISTANCES.

HABANA.														
39	EASTERN BOUNDARY OF PINAR DEL RÍO.													
43	4	CANAS.												
45	6	2	ARTEMISA.											
49	10	6	4	MANGAS.										
52	13	9	7	3	P. BRAVA.									
59	20	16	14	10	7	CANDELARIA.								
65	26	22	20	16	13	6	SAN CRISTÓBAL.							
70	31	27	25	21	18	11	5	TACO-TACO.						
81	42	38	36	32	29	22	16	11	PALACIOS.					
86	47	43	41	37	34	27	21	16	5	PASO REAL.				
93	54	50	48	44	41	34	28	23	12	7	HERRADURA.			
100	61	57	55	51	48	41	35	30	19	14	7	CONSOLACIÓN DEL SUR.		
108	69	65	63	59	56	49	43	38	27	22	15	8	MAMEY.	
113	74	70	68	64	61	54	48	43	32	27	20	13	5	PINAR DEL RÍO.

[For Itinerary see Habana Province, "1. Habana-Pinar del Río Railway," page 209.]

[For Table of Distances from Western boundary of Habana Province to Habana see under Habana Province, also for Itinerary.]

3. VINALES-MUELLE RAILWAY.

TABLE OF DISTANCES.

VINALES.

6	CONSOLACIÓN DEL NORTE (DELORES).
15	9 MUELLE [COAST TOWN] OR SAN CAYETANO.

ITINERARY.

Leaving the coast, this road travels over the mountains through Consolación del Norte to Vinales. Very little is known of the line, excepting that it must be very rough and of little importance except to connect the last-mentioned town with the coast. It crosses deep ravines and cuts through an unpopulated region, and presumedly is in poor condition.

ROADS.

This province has many good roads, the principal ones being:

1. From Habana to Coloma, 128 miles, of which 106 miles are in the province of Pinar del Río (page 147).
2. From Guanajay to Mariel, a distance of about 6 miles (page 151).
3. From Mariel, via Cárdenas, Bahía Honda to Candelaria, 61 miles (page 165).
4. From Artemisa to Alquizar, 13 miles, of which 6 miles are in Province of Pinar del Río (page 174).

1. HABANA-COLOMA ROAD.

TABLE OF DISTANCES.

HABANA.		} (HABANA PROVINCE.)									
22	CAIMITO.										
29	7	GUANAJAY.									
38	16	9	ARTEMISA.								
61	39	32	23	SAN CRISTÓBAL.							
80	58	51	42	19	LOS PALACIOS.						
84	62	55	46	23	4	SAN DIEGO.					
91	69	62	53	30	11	7	HERRADURA.				
99	77	70	61	38	19	15	8	CONSOLACIÓN.			
104	82	75	66	43	24	20	13	5	JAGUA.		
113	91	84	75	52	33	29	22	14	9	PINAR DEL RÍO.	
128	106	99	90	67	48	44	37	29	24	15	COLOMA.

[For Table of Distances and Itinerary of road from Habana to Caimito see Province of Habana, "Habana-Coloma Road."]

JOURNEY FROM CAIMITO TO GUANAJAY.

Distances from
Habana.

Just beyond Caimito, ridge of rocks above mentioned comes down to road on the right, the latter following its base. This ridge grows more rocky and rugged, is covered with brush, uncultivated, and without habitations. In front rises a palisade of white rock—a conspicuous landmark marking the Habana calzada in the vicinity of Caimito—which is plainly visible from Guanajay, as was afterwards learned. This rock rises perhaps 100 feet above road. To the left, low, rounded, cultivated hills.

Many houses along road. Less than a mile from Caimito road passes on left of mill of a large sugar estate. Wire fences now and then; stone walls frequent; but in dry weather cavalry could pass over the country to left. To right, the range of steep rugged hills, often perpendicular rock, with odd entrances to caves marking their faces, lies nearly parallel to road and probably 400 or 500 yards distant. Hills wild and thickly overgrown with brush. Road gradually but steadily ascending, undulating as it runs directly toward high white rock mentioned. Road a magnificent highway, not dusty or muddy, apparently macadamized, and wide enough for three wagons to pass abreast. Before reaching 37-kilometer post, road ascends a somewhat steep hill, passes through a cut in the top whose walls are perhaps 10 or 15 feet high. To left, country open, cultivated, and rolling. This hill commands road toward Caimito and Havana, and to some extent that toward Guanajay also, but in that direction the road runs over more of a plateau, to which it ascends by the hill mentioned.

37½ k.—23 m.

Road passes some 400 yards from the base of white rock mentioned, which is indeed a landmark that can well be seen from Guanajay, as well as in approaching from the northeast. From this point ridge on right falls away, running more toward gulf coast, and leaving a brown lumpy plateau between itself and road. Country on both sides is more open and cultivated.

39 k.—24 m.

Another large sugar mill about 400 yards to right of road. Ridge mentioned continues to trend off more to right—that is, about north. Road now slightly descending, but undulating over the many hills of this broken region. Between 38 and 39 kilometers, and at foot of a long slope, on whose top is the 39-kilometer post, road crosses a little stone culvert, spanning a very small stream, merely a low place. This about 4½ miles from Caimito. Beyond the top of this hill, road descends a little, and country continues of same character. At about 5 miles from Caimito, road passes a little brick bridge over another very small stream or pool, and just beyond, at 40-kilometer post, another, over a little stream of apparently good water. Country on each side open and rolling, cultivated

with cane and tobacco. No fences now; country good for cavalry maneuvers, generally speaking. Far away in advance, a little to left, low mountains, continuing on through the Vuelta Abajo, probably 25 or 30 miles away. At 41-kilometer post, a "citeria," one of suburbs of Guanajay, which lies about a mile in advance, in a sort of hollow, formed by low hills that generally surround the town. These hills are cleared, rounded, and cultivated.

Distances from
Habana.

Just before reaching Guanajay road passes over small stone bridge spanning an almost dry creek bed, and enters a long street that runs to plaza of Guanajay. Continuing through town, highway crosses stream by small wooden bridge, and just beyond, on outskirts of Guanajay, divides, the left road being main calzada leading to Artemisa, San Cristóbal, and Pinar del Río, the right branch continuing for a hundred yards along stream, then turning to left and proceeding to Mariel. This is called a calzada of the second order.

42 k.—29 m.

From parting of roads beyond Guanajay, road to right leads over rolling pasture regions. Some wire fences, but, as a rule, few fences of any kind. In some places depressions between hills contained a little water. Country well suited just here for the operations of horsemen. Few cattle were to be seen.

Shortly before the stone post marked 2 kilometers from Guanajay, 44 from Habana, road crosses small stone culvert over a low place, where a little water might ordinarily be expected. Just beyond road passes a little laguna or pond lying in a depression alongside. Uplands still continue. A few wire fences; telegraph from Guanajay to Mariel follows the roadside. About this point large sugar mill on knoll about half a mile to right of road. Shortly beyond 2-kilometer post, road crosses two very small stone culverts over two streamlets, and shortly after, another little run, also by stone culvert.

At about 3 kilometers road crosses another little stream by stone culvert.

About 4 kilometers road passes over small stone culvert here over low ground containing very little water. Thus far houses few, with little cultivation and few fences; a stock region, with magnificent grass and probably plenty of water.

Shortly beyond 4-kilometer post, road reaches a small cut from which gulf can be seen; here begins a rapid and long descent. To right a ravine following road in part as it descends, and in front, to right and left, undulating ground, somewhat broken, and highly cultivated. To right, perched upon some hills, the baths of Martin. There is a little town here.

Near the 5-kilometer post, road leaves the calzada and ascends hills about three-fourths of a mile to baths above mentioned. There are mineral springs, said to be remarkable for their curative powers. The point is important. It is only about 3 kilometers from the point where the Cabañas

and Mariel roads fork, and would answer excellently for a sanitary camp.

Road, still descending, passes at 6-kilometer post a small wooden bridge over a little rivulet, and near by a house of the Obras Públicas of the Provincia Pinar del Río, No. 1. Beyond this station to left a small piece of woodland, almost a forest of palms, with thick brush and vines growing in it. Country in general high, rolling, and cultivated. A few hundred yards from station road passes over two small stone culverts, then another over a very small rivulet, and continues through cultivated fields with many huts.

At 7 kilometers a large sugar mill on a hill half a mile to left of road. Then another stone culvert over low ground, and at 8-kilometer post, or about 30 yards beyond, road reaches forks of calzada, the left road rising gradually over the long slope of a hill, on whose flat summit a large sugar mill surrounded by its huts; this road continues to Cabañas.

Road to Mariel turns to right, along base of the hill, and winds around it. Sugar mill is about 600 yards from forks, and commands ground here perfectly, as well as, at intervals, road to Mariel, road being occasionally hidden in its windings by hills; road is visible from outskirts of Mariel, and from monument on Point Pescadores, in harbor. In general, guns placed on this hill would make road from Mariel very uncomfortable. This place should be taken by cavalry as soon as landing is made at Mariel. It could be shelled from the inner harbor, but ships could not probably get within sight of it, and small guns could do harm at 4 kilometers distance.

Road to Mariel bearing around to right, i. e., northward, winds at first through great fields of sugar cane, with which hills on each side are covered; maintains its previous fine character. Telegraph follows road to Mariel, and appears to go to Cabañas also. About 200 yards from forks a dirt road turns to left leading to summit of the hill and sugar mill; and just beyond is a small stone culvert over a little stream.

Between 9 and 10 kilometers ground begins to get low and marshy, especially to left, in which direction road runs on an embankment through low ground which probably becomes marshy in wet weather. To right rise hills covered with cane and often bearing palms and brush.

Some 100 yards beyond the 10-kilometer post, road crosses a culvert over a stream of some size, but probably salty, as it is now nearly opposite end of the Bay of Mariel; low marshy ground lies to left.

At 11 kilometers is another station of the Obras Públicas, lying opposite end of bay; from this point sugar mill at forks of road can be seen. Beyond this station, road continues across a stone culvert or two over streams no doubt salty, and at 12 kilometers reaches the little town and seaport of Mariel.

At the point where it reaches town stands an old ruined stone building, and to left, perhaps 500 yards from road and on the outskirts of town on a low hill, is an old stonework looking out over lower bay, the Campo Santo, or burial place of Mariel. This would be a tolerably strong place to station infantry and field guns, and should be taken at once. Hills to north dominate this, as elsewhere indicated.

From forks of road, or from hill of the sugar mill to Mariel, ground on either side of the road is unfavorable for cavalry or wagons. From within about 3 kilometers of Mariel low ground lies to south, and to north, country is hilly and broken.

2. GUANAJAY-MARIEL ROAD.

The distance between these two cities is about 6 miles.

ITINERARY OF ROAD.

On the outskirts of Guanajay the road branches, one road going to Artemisa and the other to Mariel. The latter leads over most beautiful pasture lands, the grass growing long and luxuriant. A few cattle may be seen here and there, about the only signs of life to be seen. The vast expanse of open, breezy, rolling country, almost uncultivated, looks like a well-kept park, with its palms, now single, now in clusters, nodding their feathery tops to the breeze. Over low ridges the road travels a narrow white streak across a lumpy sea of brownish green, with now and then glimpses of the Gulf to the north. From these hills the road plunges down into a ravine, over undulating but highly cultivated ground, whose green rounded hills are capped with huts placed amidst palms. To the right, perched high among the hills, lies the little village of San Martin, whose mineral springs are noted for their curative powers. Still descending, the road passes through a bit of woodland and then reaches an open country. It passes a large sugar mill, toward the sea, winding amongst hills of growing corn and cane, and reaches the shores of the quiet, land-locked bay where stands the little fishing village of Mariel.

ITINERARY OF ROAD FROM GUANAJAY TO ARTEMISA.

At the outskirts of Guanajay the road branches, one going to Mariel, of which mention is made heretofore [see Guanajay-Mariel Road]; the left-hand road being the pike to Artemisa. It crosses an undulating and beautiful country, and is a fine broad turnpike passing through a highly cultivated region, where much tobacco is raised. In the distance lie pretty wooded heights, forming a background to the undulating regions across which the road traverses, past picturesque huts surrounded by palms and bananas. The road is an excellent one the entire distance.

ITINERARY OF THE ROAD FROM SAN CRISTÓBAL TO ARTEMISA.

Kilometer
posts are num-
bered from Ha-
bana. Miles are
from San Cristó-
bal.

- Leaving the town by the eastern porteria and following the calzada, the road from Bahía Honda is crossed near the outskirts.
- 200 yds. A broken bridge, necessitating a detour over low ground.
- 250 yds. Another broken bridge crossing a stream 30 yards wide and a foot deep. Banks 10 feet high with road leading up. Ford, good bottom, pebbly. The railroad track and the bridges are only a few hundred feet to the right. After the ford the road again reaches the calzada, 500 yards from the start. The calzada, first passing over a causeway 200 yards, over low, cultivated ground, crosses an old bridge. Beyond, a cut 200 yards long, banks 20 feet high.
- 90 k.—1,200 yds. About 100 yards beyond calzada crosses an old culvert. The calzada seems less well kept here than usual, but is never muddy, and wide enough for four wagons abreast.
- 89 k.—1.4 m. The railroad is close to the right and the track is crossed about 100 yards farther on. The country is open, slightly rolling to the left toward the mountains, but flat toward the left; 400 yards farther on a small bridge. At about 600 yards, another old bridge over a stream of running water, 20 feet wide, 1 foot deep, low, shelving banks; no trouble in fording. At 800 yards another old bridge.
- 87 k.—2.5 m. The calzada crosses the railroad at a little house; track now on the right.
- 86½ k.—3.1 m. A few houses. The railroad 400 yards to right. Another old wooden bridge, over rivulet, with little water; easily forded.
- 86 k.—3.3 m. A small pond by the roadside; low, open ground to the right as far as railroad. The country is the same open, rolling, cultivated region toward the mountains on the left; railroad about half a mile away. A country road enters near here from the left.
- 85 k.—3.6 m. A small stone and brick culvert over a low place.
- 84½ k.—4 m. A stone culvert 20 feet long over a creek 6 feet wide; good ford.
- 84 k.—4.3 m. The calzada crosses small culvert. The country to the right becomes higher with more cultivation; railroad out of sight in the brush to the right. Two hundred yards beyond a good country road crosses the calzada.
- 83 k.—5 m. Outskirts of the town of Candelaria.
- 82 k.—5.6 m. End of the town of Candelaria, and 25 yards farther a small culvert. Fifty yards the calzada again crosses the railroad, the latter now to the left.
- 81 k.—6.4 m. Railroad half a mile to the left, in a hollow, the ground between it and the calzada being good.
- 80 k.—6.9 m. A very small culvert. Here there is more brush, the railroad about 1,000 yards to the left. Sixty yards beyond is the small village of Bayerta.
- 79 k.—7.5 m.

A dangerous wooden bridge crossing a stream 30 feet wide and a half-foot deep; the banks slope to a very good ford, which may, however, become muddy. Stream would not be hard to cross. Water clear and good.

Distances from
San Cristóbal.
78½ k.—7.8 m.

No cultivation, brush on either side. Railroad hidden, but probably a mile away. Road in fine condition.

78 k.—8.1 m.

A good country road to a house on the right.

77½ k.—8.4 m.

Another brick and stone culvert 40 feet long.

77 k.—8.7 m.

Another culvert over low ground and rivulet 6 feet wide.

76½ k.—9 m.

This is the end of the low ground, and cultivation again commences.

The station of Obras Públicas Pinar del Río, No. 6. Here railroad is not far to left, but out of sight. The intervening country is fine and open and has much timber.

76 k.—9.3 m.

The same level, open, pleasant region, little cultivation, little brush, and generally fine land.

75 k.—10 m.

Calzada bends to the left. The poles of an old telegraph line are here seen in places along the calzada.

74½ k.—10.3 m.

To the south the country is as level as a floor. To the left it is open and level for half a mile, then rolling to the hills, which are to the northeast.

73 k.—10.6 m.

There is a hollow and the country a little more rolling.

72 k.—11.4 m.

A small collection of a dozen huts called Puebla Nuevo. The country flat, meadows, with brush here and there.

69½ k.—11.7 m.

A fine, clear pond, almost a lake, on the right, 200 yards from road.

67½ k.—14.4 m.

The country becomes brushy.

67 k.—14.7 m.

House of the Obras Públicas, Peones Camineros Pinar del Río, No. 4. The railroad out of sight in the brush to the left, but not far away.

66½ k.—14.9 m.

The miserable, deserted village of Los Mangos.

65 k.—16.2 m.

A fine pond to the left, huts and small culvert on road. The railroad is near and can be reached with little difficulty.

64½ k.—16.6 m.

Roads and houses to the right and left. Here is a fine, level, well-cultivated country.

60 k.—19.3 m.

A good country crossroad of red dirt. The country here is rolling, with much cultivation and many houses.

59 k.—20 m.

The railroad lies not more than 200 yards to the left. The ground is somewhat low. The town of Artemisa lies some 500 yards to the left and ahead.

58 k.—20.5 m.

The track of the Western Railroad is passed and the town of Artemisa is entered. Artemisa is thus 21 miles, or 33.5 kilometers, from San Cristóbal.

57½ k.—21 m.

ITINERARY OF THE ROAD FROM SAN CRISTÓBAL TO PALACIOS.

On the outskirts of San Cristóbal the road passes within 50 yards of the railway station. This would afford a good stopping place for troops, as the ground is level and firm. A few hundred yards beyond the station the road crosses the railroad track, putting the latter on the right. Before crossing, a road

Distances from
San Cristóbal.

branches off to the right and follows the line of track. The country here is a level meadow, with little cultivated patches of tobacco and corn near thatched huts, with here and there small brush and cactus. The road is a good country road of a reddish gritty dirt, probably never muddy. Roads can be made anywhere in this region. To the right of the road are the mountains, extending to the east and west, to the left a level plain, with the view limited only by the palms and brush. This is a fine grazing section, with few fences and no inclosures except near the huts.

1½ miles.

An old road to the left, main road to the right, continuing through meadows, with long brownish grass partly cured, similar but better than the kind seen commonly in Texas. The railroad a few hundred yards to right.

2¼ miles.

A few huts, which are becoming more rare. The road crosses a rivulet 4 feet wide and 4 inches deep; ford good, bottom hard, and probably never muddy. Railroad 100 yards to the right of the road and a few hundred yards from the rivulet. Road crosses track; railroad now on left. Road continues good wagon road, somewhat sandy, but always fair. Lane made by wire fences. Level meadows on both sides, with little cultivation.

4 miles.

Road crosses splendid rivulet 4 feet wide and 3 to 4 inches deep, clear running water; banks low and sloping; bottom hard and never muddy on account of gritty soil. Little outcrop of rock in this region. The mountain range runs up from the plain with few foothills or broken ground.

4¾ miles.

The little town of Chirrigota, a pretty place, three-fourths of a mile to right of road. The road here is good, gritty, level, and never muddy. Now and again a place that shows mud in wet weather.

6 miles.

Road crosses a fine stream with hard, gritty bottom, no mud, 20 feet wide, a foot deep, with shelving banks. At times this river is hard to cross, as shown by the primitive ferryboat that lay on the bank ready for use. A few hundred yards beyond this the little town of Santa Cruz, the most conspicuous building of which is the church. At the church a road turns to the right, while the main road continues to the left toward the railroad, which runs through the brush, and is about one-half mile away. Santa Cruz probably not visible from train. Road continues good and sandy across a low meadow to the railway station of Tacobaco, a mile and a quarter from Santa Cruz.

At Tacobaco the road crosses the track, making a broad sweep to the left. Beyond Tacobaco the road becomes somewhat sandy, but is a good wide wagon road.

7 miles.

The road crosses a fine creek, the bottom hard and gritty, the banks sloping, 20 feet wide and 6 inches deep. The shelving banks may become muddy. The banks proper of this stream are about 50 yards apart and 20 feet high, and there is

plenty of timber in the vicinity should it become necessary to build a bridge. Here the road forks. That to Palacios goes to the right, on through a low, flat brushy country, where there is little cultivation and no fences. The mountains are about 3 or 4 miles to the right. Distances from San Cristóbal.

The road begins to show more indication of mud in wet weather; there is less grit in the soil, but the road is still probably always fair. After passing through a gate, the road continues on through a brushy region, with fine grass and many cattle. One hundred yards inside of the gate the road forks, the main road leading to the left, while the right leads to Santo Domingo, through a flat, brushy country, with fine grass. The main road becomes very good, over sod; wagons can go anywhere. The road continues a regular prairie road, with occasional patches of brush and a few palm trees. The mountains shut off the trade winds. Little mud is to be expected here; wagons can pass at all times. There are many wagon tracks. The road here runs at right angles to the mountains for a short distance. 9 miles.

The road passes a good pond, surrounded by fine grass. The country is as level as a floor, with little cultivation. Five hundred yards beyond the pond is a large house, to which a side road leads. The main road continues beside the inclosure, through a fine, open country. 10 miles.

Low ground, with standing water. This would make mud holes in any other soil. Just beyond a good sized pond. Here the road enters a country where the palms become more numerous, and the small palm shrubs appear for the first time. The brush becomes thicker and the mud holes more frequent. There is little to indicate the main road, unless it be that the brush has somewhat the appearance of being cut in straight lines on either side. The road passing by the side of water holes may become bad in wet weather; nevertheless, it would be passable. 10½ miles.

A stream of good water, with pebbly bottom, hard, and probably always good, though the banks may become muddy. The stream is about 20 feet wide and 6 inches deep; water good. Timber near at hand for a bridge, in case it is necessary. A ferryboat on the bank. Here the country is flat and bushy, with little tobacco cultivation, and no cane farms. 13 miles.

Beyond this the road continues good, though it may be heavy in wet weather, but wagons could always pass through the brush and the old fields on either side of the road.

The road here passes through a considerable slough in which the water even in the dry season stands on the main road about a foot and a half deep and a hundred yards wide. The bottom, however, is hard. Near by is sufficient timber for a bridge, or for corduroying if that should become necessary. Beyond the slough the road continues through low ground, but quite good. 14 miles.

- Distances from San Cristóbal. A small creek of muddy water, an unusual thing in this section where nearly all the streams are clear running water. This creek is about 6 inches deep and 6 feet wide, with sloping banks that would probably become muddy in the wet season, but during the dry season are very good.
- 14½ miles. The country around is low, flat, and brushy, with no cultivation. The road is nearly parallel to the hills, and some 6 to 8 miles to the right.
- 15 miles. The road passes through great brush-covered prairies dotted with trees, level, and with fine grass. The road is good in the dry season, though it may be muddy in the wet. Still, wagons can pass anywhere. The road runs about west. To the left there is a level country, tree-covered, continuing as far as the eye can reach. The railroad is some distance to the right of the road. No cultivation and no signs of there ever having been any in this wilderness.
- 16 miles. Here the road passes a small stretch of ground that may be muddy in wet weather.
- 16½ miles. After passing a few frame houses, the road touches the telegraph and the railroad lines. The road very good and probably always good, as the soil is gritty.
- 18 miles. The road crosses the railroad track about 100 yards from the station of Palacios. The station house is of wood, with clear, good ground about it. An excellent place for debarking troops.

ITINERARY OF ROAD FROM PALACIOS TO CONSOLACIÓN DEL SUR.

- Distances from Palacios. The station of Palacios is of wood, with clear ground around it, and would be an excellent place for landing troops. The town contains perhaps 2,500 people, several tiendas, and a station for priests. West of the town is a good-sized creek. There is a station of the Guardia Civil here. There are many negroes, but the whites predominate. At the western end of the town there is a hill, at the foot of which is a stream of clear, good water. This stream is some 15 yards wide in dry season and 1½ feet deep, with a hard bottom and a good ford, and a primitive ferryboat housed up in readiness for wet weather. There is plenty of wood at hand wherewith to construct a bridge.
- Beyond the stream this road continues a good, level, broad, dirt highway, that might become heavy in wet weather; it is a fine wagon road, over which in general two or three wagons could pass. The fields on each side could as a rule also be used. To the right and left were fields cultivated with tobacco and garden truck, and sometimes corn. Corn fodder is the staple article for cattle here, and is called *maloja*. This and a kind of grass and corn is the chief food. Oats appear to be unknown.

About a mile from the town, there is a low piece of road which may become muddy in wet weather. Huts are plentiful. The railroad lies out of sight in the brushy country to the south. The country is level, cultivated, with many trees, chiefly palms, singly and in groups. Beyond, the road becomes sandy. Another stretch of low meadow ground to the south and thatched huts.

Distances from
Palacios.

1 mile.

1½ miles.

The road continues good, sandy, and gritty. Horses and cattle are plentiful in this region.

The road passes through hedges lying on both sides, with meadows and a few fields of tobacco to the right and left. A little over 2 miles from town a road runs to the right, while main road continues over a slightly undulating country, with fine open meadows and some brush. Small pond to the left, the country on either side being brushy and low, and the road gritty, with meadows and huts on either side. Beyond, the road grows more sandy, passing over a level country with less brush, dotted with solitary palms and between extensive meadows without fences, over which horses and wagons could pass anywhere. The ground is covered with low, brown grass, and the region would be admirable for calvary operations. To the north, at a distance of 7 or 8 miles, rise the mountains, while to the south, in the level region toward the southern coast, the palms seem to thicken to forests. Here and there are a few solitary thatched huts. The mountains are less densely wooded; the road now lies between them and the railroad.

2 miles.

2½ miles.

The road reaches the little pueblo of Paso Real de San Diego, a place of perhaps 1,500 inhabitants, and the point where a road runs northward into the mountains to the mineral springs of San Diego.

4 miles.

Paso Real consists chiefly of one long street, lined with white stone stucco-covered houses, the more pretentious ones having large pillars and a roofed porch in front. There are many shops and a fonda or two, one hotel called La Palma. The water comes from a public well, marked "Para Publico," from which the water is drawn by hand. There is a station of the Guardia Civil here.

Beyond the town was a hill, down which the road goes; the roadbed is rough and water-washed. At the foot of the hill is a small stretch of low ground, but the roadbed is sandy.

A fine, clear, rapid stream, considered a river in this country, 1½ feet deep, 15 yards wide, with a pebbly bottom, long shelving banks. There is no bridge, but the ford is good. From the primitive ferryboat drawn up on the bank one would judge that it may become difficult, though these ferryboats are only for foot passengers. On the farther bank are a few huts, trees, corn, and tobacco. The road here is probably muddy in wet weather.

5 miles.

- Distances from Palacios. A pueblito, or small town, containing a little fonda and a few houses, and surrounded by a few tobacco and banana patches. The road here is very good, passing over wide, rolling meadows, nearly free from brush, and with no fences. The dark mountains rise on the north, and palms and bushes are seen far away across the meadows to the south. A wagon could go in any direction across this region. Farther on a tiny rivulet crosses the road. The road beyond continues over an open, grass-covered country, with few huts and no cultivation.
- 6 miles.
- 7 miles. Road crosses another small rivulet with sloping banks. Water is probably always abundant. A few hundred yards farther on a local road *crossés main*.
- 8½ miles. Latter road continues good over rolling prairie, with woods in the distance and brush around at intervals in copses. The grass is excellent. Another small rivulet. There are a few trees and bushes. A few hundred yards farther on is a small, unimportant road, probably leading to huts, of which there are a few in the neighborhood.
- 9 miles. A few huts, some fences, and the open meadows almost ceased, the country becoming more wooded; but the brush and woods are not thick, and the road probably is a good wagon road at all times. Near here, to the left, is a fine large pond close to the road. Little or no cultivation and only a few huts. Across the road, like a toll barrier, was a fence, with a large gate for wagons and a small one for horsemen.
- 10 miles. The highway reaches a little scattering town, surrounded by brush, called Larradura (probably La Herradura). Here there is a kind of clearing or old fields grown up in brush. The place is going to decay. In the midst of the long, straggling town, most of whose houses occupy fields fronting on the road, there is an old, rickety, wooden bridge, some 50 feet long, across a little stream about 6 feet wide and a foot deep, with banks sloping at the ford. The ford near the bridge is safer than the bridge itself. The road down the banks is rough and water-washed. A good bridge could readily be constructed, for there is plenty of timber at hand. On the outskirts of the place is a gate, just beyond a small road, and a little fonda to the left.
- 11 miles. From here the road continues through a bushy region, with a wire fence or two alongside inclosing meadows. A small water hole and hut. There is little cultivation here, chiefly meadows. A small road runs off to the right.
- 12 miles. A small, low place, with very little water. The road continues in good condition, running over rolling meadows, brushy in places. The mountains lie some 8 or 10 miles to the north.
- 13 miles. About 13 miles is a hut, and a large pond to the left and a small one to the right. The road now runs a little south of

west, over a brushy country with meadows. A few hundred yards beyond the pond a road enters from the right. Distances from Palacios.

Another gate shuts in the road. Near by are several houses. 13½ miles.
The road continues a good wagon road, sandy, and running over a rolling meadow country.

Road comes to a little wooden bridge over a rivulet some 12 feet wide, with steep banks about 10 feet high. The stream itself is perhaps 4 feet wide and a foot deep. A bridge would be necessary here, but there is plenty of timber at hand for its construction. The rivulet is on the outskirts of the pueblo of Santa Clara, a very small place, with a few widely scattered houses and a fonda near a cross road. The country beyond is a rolling prairie, with a few huts and but little cultivation, except occasionally tobacco, a little corn, and bananas. The latter is one of the chief articles of food; perhaps the most used. 14 miles.

Two houses near the road and a road to the right along a fence, the main road continuing to the left through a cut some 10 feet high, but short, to a stream 4 feet wide and 6 inches deep, with hard, gravelly bottom, shelving banks, and no bridge. Some 200 yards beyond this point a road enters from the right. The meadows continue dotted with trees and copses of brush. A small rivulet, probably not difficult to cross at any time, and half a mile beyond—i. e., 16 miles from Palacios—road reaches what is called Los Arroyos de las Cruces. 15 miles.

A very little water runs through the bed of the Arroyos, and there is some brush that might afford a hiding place on the right, but there is not a large ravine. In fact, since leaving San Cristóbal there have not been many places especially favorable for an ambushade of a large body. There have been no ravines of importance, merely brush and copses, hedges, and an occasional low cut. The road down the first arroyo is water-washed, the banks are sloping and probably never very difficult from mud. A hundred yards beyond is another little arroyo, and near by are some palms and fine brush. The mountains are now about 6 miles to the north, road running nearly parallel to them. 15½ miles.

Consolación del Sur may be seen, the road now running, as before, over pretty meadows with good grass, a little brush and palm groves here and there. The road runs up to sloping hills, on which the town stands. The mountains are on the north, at a distance of about 5 miles. On the south is a flat, slightly rolling country, with palms and undergrowth, the latter not very dense. Wire fences here and there along the roadside. The town of Consolación is at a distance of 18 or 19 miles from Palacios. 17 miles.

ROAD ITINERARY FROM CONSOLACIÓN DEL SUR TO PINAR DEL RÍO.

Distances from Consolación del Sur.	At the western end of the town a road descends the small hill on which Consolación is situated, and crosses a little rivulet. The road runs generally a little south of west, and nearly parallel to the mountain range, as has been the case since leaving San Cristóbal; it leads over an open, rolling country. Tobacco fields become more frequent, there are many houses and huts, and the country, dotted with palms, has a pretty, park-like appearance. The hills, some 5 miles distant to the north, are more barren and brown than before.
2 miles.	The road begins to grow heavy with sand. About half a mile farther on, there is a brick bridge over a little stream about 8 feet wide, with steep banks 10 feet high. A few hundred yards beyond, an old house, near which a road enters from the right; tobacco and corn growing near by. A wayside fonda, near which a road runs to the left; near by is a house, some tobacco fields, and then a wooden bridge probably 150 feet long, over what is called El Río Granadellar.* The stream is large for Cuba, probably 80 yards wide and 8 feet deep, with shelving banks, and a ford. It is one of the largest rivers in western Cuba, but would not prove a serious obstacle, and material could readily be found for bridging. Near the stream are houses, and tobacco fields inclosed by wire fences. The road continues sandy. These dirt roads become exceedingly bad in wet weather. The road passes by a small fonda; near by are tobacco and huts. Though the road is heavy when much used, a wagon and horses could go in any direction, as there is little to obstruct in the way of bridges and fences. The country about here seems never to have been cultivated. The road reaches a small rivulet, about 4 feet wide, with sloping banks, not muddy, and a good sandy ford. Beyond, the road again becomes somewhat heavy from sand, passing over an open, rolling country, with huts and cultivation.
3½ miles.	Road reaches a wayside fonda, which are now becoming more common. This fonda is called La Haya. Near by a road comes in from the left. The road continues over a rolling country, with a little tobacco and corn, but not much cultivation.
4½ miles.	The road crosses a small wooden culvert over low ground, now dry, and a few yards beyond there is a wooden bridge on stone abutments. This bridge is some 100 feet long, and the stream about 10 feet wide and 6 inches deep, a circumstance which shows how greatly the volume of water in these streams is likely to increase. The water is clear, the banks sloping, and there is a good sandy ford. On the farther bank is a fonda. The road is now heavy from sand. Near it are a few huts surrounded by some small tobacco patches and a little
5 miles.	
6 miles.	

*Probably Río Hondo.

corn. The Vuelta Abajo is said to be well suited to corn, and the hillsides especially well adapted to grape culture. Cane does not do well here. The country is now rolling, somewhat brushy, over which, however, a road could be made anywhere. The road itself is heavy with sand.

The main road goes to the right and the one described to the left. A few hundred yards beyond this point a road comes in from the left. The road continues as described over a rolling meadow country, a little brushy in places, with little cultivation and a few trees, usually palms. Trees grow more abundant toward the south. On the north the mountains seem low and barren, with less timber. A few sharply denticulated peaks stand out in the distance, a characteristic landmark when the mountains are usually rounded, and are quite distinctly seen from Pinar. To the left the country is rolling, with fewer trees than before.

There is a low place in the hills to the right, where the mountains look as if they might be easily crossed. Just beyond here the telegraph appears by the roadside.

The road reaches a wayside fonda, called La Puerta San Juan. Here the country is open and rolling, with little brush and few trees; there are fine meadows and occasional fields of tobacco and corn, but the region is not highly cultivated. The soil is light and sandy. Road almost impassable from mud during rainy season.

Road reaches a fonda at the Pueblito of Paso Viejo. Beyond the fonda, descending a somewhat steep hill, the road reaches a wooden bridge, some 100 feet long, over the River Paso Viejo. The river is 20 yards wide, a foot or two deep, with banks 20 feet high; the bottom sandy and firm, as is generally the case in the dry season. No trouble in fording. In the wet season all of the rivers would probably be unfordable at times, but ample material for bridges exists in all cases.

Country is rolling and more open, with huts dotting the meadows here and there. There is little cultivation, and few fences. Roads could be made in one place as well as another. The mountains are some 6 or 7 miles to the north, running in a direction generally parallel to the road and a little south of west.

Roads and railroads cut the rivers at points as high up in their course as possible. A little corn is growing, but in general there is nothing but grass, which is better than that of the barren pine lands south, and good for cattle. The grass is not as good as the wild prairie grass of the United States. There is a bunch grass, however, growing with the other, that is much better. In spots, too, grows a short grass called "pata de gallina" (hen's foot), which is very good for stock, and still another variety, called "yerba de Parana," is found along streams, where it grows to a length of 6 feet or more, often running along the ground and taking root at

Distances from
Consolación del
Sur.

7 miles.

8½ miles.

9 miles.

10½ miles.

12 miles.

Distances from
Consolación del
Sur.

the joints. Of this latter the horses and cattle are extremely fond, and it is good and luxuriant. In low spots it is valuable in preventing the sinking of animals in passing, as well as to hinder the washing away of banks. There is a bad grass called "yerba de San Carlos," which is found chiefly in cultivated ground, and is a nuisance much dreaded by sugar planters. This grass is good for nothing; even the cattle will not eat it, as it has serrated edges.

13 miles.

Pinar del Río, lying due west, may be seen, many houses about, huts dotting the country, the road somewhat heavy and sandy; corn and bananas are growing here and there, but little tobacco.

The country around Pinar del Río is pleasant, open, and rolling. On or near the top of the low hill on which the town lies, the most conspicuous object seen is a large flat building of stone, used as a cuartel for troops.

14 miles.

The road is crossed by a small stream; sandy soil. Near the foot of the hill on which Pinar del Río lies, a road comes in from the north.

14¾ miles.

Ascending the very gradual slope of the hill, road passes a brick and tile yard, and a good white house of stone and brick, covered with stucco. There is a wooden bridge, perhaps 100 feet long, over El Río, Pinar del Río, as it is called. This stream is some 40 yards wide, with low grassy banks, a good ford, and a bottom of sand and gravel. The water is clear and good, about 2 feet deep. There is ample timber near by for a bridge, but no timber on the banks of the stream. Between the banks the distance is about 50 yards; they are 10 feet high, and, as is usually the case in this region, are of dirt or a very soft white limestone. There would probably be little trouble from mud here at any time, but no doubt the river would need to be bridged at some seasons. It is said that all these streams—in fact generally throughout the island—can be forded, even in the rainy season by waiting a day or two after a heavy rain in order that the water may subside; a day usually is sufficient. The river is about half a mile from the town, which is some 15½ miles from Consolación.

ITINERARY OF CALZADA FROM PINAR DEL RÍO TO COLOMA RIVER MOUTH, EAST SIDE OF BAY OF CORTEZ.

The fine, broad calzada, leading to the south, starts from the eastern part of the town; turns southward from the main street at a point near where the slope begins. The calzada is a fine macadamized turnpike, with stone kilometer posts, rounded surface, with good ditches on either side, and is as white and smooth as a floor, wide enough for three, and on a pinch for four, of our wagons. It is the only one in Cuba west of San Cristóbal. The approach is to some extent commanded by the high ground on the west. After leaving the town it passes through vegetable gardens and tobacco patches, past houses and huts.

Huts, with patches of tobacco and corn. Country somewhat rolling, with trees scattered singly and in groups, and a little brush. Beyond this point road passes through some low, bushy ground on a small embankment.

The calzada crosses a small brick bridge over a little stream; the bridge not specially important; its loss no obstacle to an advance. Beyond bridge are cultivated fields. Beyond, the country continues open and rolling, with little cultivation, but with extensive meadows bearing luxuriant growth of grass. In appearance this region is an admirable grazing country, but grass is not good for stock; cattle will eat it when very hungry, but it will barely sustain life.*

Between 4 and 5 kilometers road has one small brick culvert, some 15 feet long, over a little rivulet.

A house of the Obras Públicas of Pinar del Río—peones camineros, they are called. At about 5½ kilometers fine dirt road comes in from south, running in a direction a little south of west; and at 5½ kilometers calzada passes over wooden bridge resting on stone piers. Bridge is some 50 feet long, over stream with steep banks and seemingly no ford. Should bridge be destroyed another would probably have to be built, but there is timber enough—both pine and palm—not far away.

A little culvert over a tiny rivulet.

At 8 kilometers little cultivation remains; grass continues as fine in appearance as before. To left a little more brush appears, and huts were still frequent. The mountains are nearly directly in the rear. From 8 to 9 kilometers road runs east of south, but before reaching the latter point the calzada crosses small brick culvert, passing over low ground of a creek bed. Many small pines here and small, pine-covered hills, fair grass, and little cultivation. From 9 to 10 kilometers direction of road is south by east.

Low pine hills, rather to be described as rolling ground covered with pines, little cultivation, apparently good grass of character mentioned, and small house to the left. A few palms to be seen, but palms and houses are becoming scarce. From 10 to 10½ kilometers calzada runs south. At about 10½ kilometers, some 2 miles away to the right, is a tobacco estate called "Vega de Tabaco," with its houses. One large building had appearance of a church, and entire group looks like village.

Country now low, flat, pine-covered, with no cultivation to be seen; pines are small, averaging, perhaps, 15 or 20 feet in height, but region seems breezy, healthy, and pleasant, though soil is poor. About 11½ kilometers good dirt road runs to right, probably to the vega. From 11 to 12 kilometers calzada runs south by east.

Distances from
Pinar del Río.

1 k.—½ m.

2 k.—1 m.

3 k.—2 m.

4 k.—2½ m.

5 k.—3 m.

6½ k.—4 m.

8 k.—5 m.

10 k.—6 m.

11 k.—7 m.

* This grass is nourishing to a small extent when young, but when old it is sour and unfit for stock.

Distances from
Pinar del Río.

12 k.—7½ m.

Country continues level and uncultivated, covered with low pines growing wide apart, with apparently good grass; no houses in sight. Good ground for march of troops and favorable for cavalry operations as far as Pinar. Only obstacle is the river mentioned; in wet weather, however, a few low spots would be found marshy and difficult, but they are small. Ground in this vicinity would never be difficult for horse or foot to march over; soil is too light and sandy. In the ditches by side of the road there is at times a little water. Road wide enough for three or four wagons, but with crown or cross section curving; a fine highway, and is in good repair. Soil here is sandy, and country presents appearance of a northern region. No telegraph follows the calzada. In fact, Coloma has no telegraph communication. This is an important fact should expeditionary force land here and capture Pinar del Río and western bed of railroad.

From 12 to 13 kilometers course of calzada is south.

13 k.—8 m.

A little dirt road crosses calzada. No cattle, houses, huts, nor cultivation—a lonely pine-covered region, with occasional low spots, containing at times a little water. Ground in general is dry, and favorable for march of troops and horses. No fences except where there is a hut. No bridges or walls; even the calzada is uninclosed. Road well ditched, as a rule, on both sides, and is kept in good repair; though an old calzada, it is almost as good as the newest. About 14 kilometers road crosses small stone culvert over little stream bed with small water hole to right.

15 k.—9½ m.

At 15 kilometers country same lonely wilderness as before. From 15 to 16 kilometers road runs southeast by east. Grass continues apparently good. Since leaving 7-kilometer post few houses have been seen. There is, probably, enough water for small force in the ditches and low spots that occur from time to time. Cattle are few.

17 k.—10¼ m.

Near 17-kilometer post small culvert over a water hole; road runs nearly east.

18 k.—11 m.

No houses, no cultivation or cattle, but a great stretch of pine barrens on each side.

19 k.—12 m.

Here a few cattle. Character of the country continues same; road lonely.

20 k.—12¼ m.

Country continues same, interminable pine barrens; calzada runs east. Country and direction of road remain same at 21 and 22 kilometers. Little or no water.

21 k.—13 m.

23 k.—13¼ m.

Marshes on each side; water crossed on small stone culvert. Marshes are due to Coloma River, a short distance to the left. This low place should be taken at once and held, in case of a landing, in connection with the causeway mentioned below.

24 k.—15 m.

Country now on either side impassable for wagons and cavalry, and nearly so for foot troops probably at all seasons. Covered with thick brush; to the right country is a low jungle, and road now runs over a causeway or embankment some

6 feet high. Country continues same for some distance beyond. Before reaching 25-kilometer post calzada enters town of Coloma, passing around warehouse and terminating at dock.

NOTES ON JOURNEY FROM PINAR DEL RÍO TO COLOMA RIVER MOUTH.

Coloma, by calzada, is 24 kilometers and a fraction from Pinar del Río, as shown by the posts on the road. It was formerly the shipping point for tobacco from Pinar, and a port of importance; but now it is much less so—almost of no importance at all. The calzada is said to be the only one in the Vuelta Abajo—the only one west of San Cristóbal. The town lies within 100 or 200 yards of the mouth of the Coloma River. Up this, a league according to one man and two according to another, say 4 miles, lies what was once a town called Colon; but now there is nothing there but an old crumbling stone house. This is the port of Consolación del Sur; the city lies at a distance of about 6 leagues, i. e., 15 miles, and is connected by a dirt road with that place. This road is very muddy and bad in wet weather.

3. MARIEL, CABAÑAS, BAHÍA HONDA, AND CANDELARIA ROAD.

TABLE OF DISTANCES.

MARIEL.			
15	CABAÑAS.		
34	19	BAHÍA HONDA.	
61	46	27	CANDELARIA.

ITINERARY OF ROAD FROM MARIEL TO CABAÑAS.

From Mariel the calzada, or turnpike, runs across lowlands, gradually growing firmer as the Hill of the Sugar Mill is approached. This mill lies at the separation of the road from Guanajay into two branches, the northern going to Mariel, and the other to Cabañas. This fork is about 2 miles from Mariel. The hill commands the road to Guanajay, and must be taken in the event of an advance from Cabañas or from Mariel toward Guanajay. The position could be turned by an advance from Mariel, leaving the highway at the 10-kilometer post; but if the hill were held by the enemy, the advance would have to be made, in part at least, under fire. It is to be observed that this Hill of the Sugar Mill is commanded by a superior height on the Cabañas road, not more than half a mile distant, up which the turnpike ascends through low cuts. The approach from Cabañas, on the farther side, is hidden.

From the fork the turnpike runs across the eastern side of the Sugar Mill Hill, passing, before reaching this, through somewhat low ground for a short distance, across one or two stone culverts. From the Sugar Mill Hill to Cabañas it is

Distances from
Mariel.

2 miles.

Distances from sufficiently wide for three of our wagons to pass abreast Mariel.

3 miles. The top of this hill is clear, commanding a good view of the country northward. A dirt road communicates with the old Cabañas road, and is in dry weather good and hard. About a mile from the Sugar Mill Hill the road crosses a very small stream. There are evidences of mud during wet weather in the deep cuts.

4 miles. A few hundred yards beyond the rivulet, passing another sugar mill on a hill, the road descends into a low valley, a level road going off to the right. Half a mile beyond the mill the road crosses another little stream about 10 feet wide and 1 foot deep, with a good ford. Here are cane fields to the right, and open country, brush covered to the left, and all about low hills, sometimes covered with palm trees and brush, sometimes cleared and cultivated. Road here wide enough for two wagons, but at times only for one.

4.5 miles. The road crosses a long bed of rivulet by a small bridge, and beyond, a little stream. Banks of road here about 6 to 8 feet

5 miles. high in places. Crosses a creek of clear water 10 feet wide and 1 or 2 feet deep, but not fordable on account of steepness of banks. Plenty of timber available for bridges. Abundance of water in this region. Country, brush covered; few fences, except along road, and almost none of wire. Thickly wooded hills, brushy, and uncleared in places; palms, guavas, and many bananas.

5 miles. Road narrow and shut in between hedges. Telegraph line frequently strung on palms; follows road. Horses plentiful. Road very narrow for a short distance, passing through a cut barely wide enough for one wagon. Is also undulating hereabouts, with some steep grades. Soil a fine loam and very heavy in wet weather. A range of tolerably high hills to the left, wooded to the top, and about a mile, or half a mile, from the low valley. Road begins to ascend rapidly; many places well fitted for ambuscades. Reaching the top of the hill, a good view is had both to the north and to the south. Road begins to grow broader.

6 miles. Large sugar mill. Half a mile beyond, road turns into the calzada and crossing it, goes on to a pueblo, Quebracho by name. About 400 yards along the pike is the top of a high hill, giving a view for miles around, and forming a good site for a signal station, being open and clear. The pike up to this point

7 miles. practicable for wagons, three abreast. The dirt road here hugs the pike, which is complete as far as the 16-kilometer post, the unfinished part continuing some miles further. Dirt road very narrow, very steep grades, impassable in wet weather; high banks, a few hundred yards farther. Large sugar mill, with its railroad. A few flat cars. Beyond the mill, road crosses a black, sluggish creek. Country open, many mills and cattle. Two miles beyond 16-kilometer post, a rivulet between hills; another rivulet a few hundred yards

8 miles.

beyond; good clear water. Another small rivulet, then a steep hill. At 12 miles a small culvert, and another sugar mill, houses of wood and of stone.

Distances from
Mariel.
11 miles.
12 miles.

Country open, rolling, grassy; road good in dry weather; wagons and troops could march on ground along side. About 18 miles, small pond half a mile to the left; 50 yards to the right the real work, i. e., embankment, of the calzada comes to an end. A few hundreds of yards farther is a small wooden bridge over a good stream 10 feet wide, 2 or 3 feet deep, banks 10 feet high and steep, no ford. A short distance beyond, another tiny stream crossed by a stone culvert, and, farther yet, another small stream, with wooden culvert. Road now ascends cane-covered hills. On farther side of these runs a large road going south and west. Going south the road is bad; high banks, deep ruts. Cabañas to Habana, about 44 miles. Horses in this region abundant and fairly good.

13 miles.

15 miles.

GENERAL REMARKS ON THE HIGHWAY LEADING FROM MARIEL TO THE JUNCTION WITH THAT FROM CABAÑAS TO GUANAJAY.

On leaving Mariel the highway at first leads about south-east, between a somewhat steep and well-wooded range of hills on the left (northeast), running parallel to the road and but a few hundred yards distant, and low ground close by on the right. The ground on both sides of the road is unsuited to the march of troops until 9-kilometer stone is reached. Then, possibly, on the left, cavalry and infantry could march over the open grassy hill, into which the more rugged brushy hills have run. From this point the sugar mill on the hill commanding the junction of the two highways is only 3 kilometers distant, and if it became necessary this position could be turned to the right in an advance from Mariel, at the head of the low ground which lies along the southeast coast of the Bay of Mariel. A difficult maneuver, however, and only to be attempted in case the mill should be strongly held. For the ground on the right of the highway which must be passed is low and overgrown by high cane. The mill so perfectly commands all these highways, i. e., the main one from Guanajay, the Cabañas branch, and that of Mariel, that it must be captured and held at once upon attempting to hold Mariel. If neglected, a force of infantry and a few field guns could prevent an advance from Mariel and perhaps make that place untenable.

Practically the only way to reach Cabañas from Mariel is to follow this highway which leads south, although the former place lies nearly due west of the latter. To try to follow more nearly the coast line would simply mean to cut across country, and that, too, across a country which is marshy at many seasons, or when not, it is so generally covered usually with a heavy growth of sugar cane as to be almost impenetrable for men and horses.

From the southern shore of the Bay of Mariel low, swampy ground extends to the ridges which rise to the hill of the sugar mill, and at this hill, i. e., at the junction of the road to Cabañas, the first point is reached where it would be practicable to turn westward, in the direction of Cabañas. This is 4 kilometers from Mariel.

About $1\frac{1}{4}$ kilometers before reaching the forks of the highway a dirt road to the right leads up the hill to the sugar mill. (Distances are given in kilometers because the highway is so marked, and on the ground points could thus be more readily located.) This is the nearest point to Mariel at which it would at this season be practicable to turn the head of the Bay.

From Mariel the hills on the left continue close along the road for about $1\frac{1}{4}$ kilometers, then they recede, leaving low ground on the left, after which other hills continue near the road, but grow lower and more gentle.

Around the hill on which the mill stands a little rivulet flows. The mill itself is a very large one, with an enormous open shed, red tiled, and surrounded by a few thatched cottages occupied by negroes, and all about it an open undulating country covered with cane. From the mill the Bay of Mariel can well be seen.

ITINERARY OF ROAD FROM CABAÑAS TO BAHÍA HONDA.

Distances from
Cabañas.

The road in general is very hilly, but is practicable for wagons to within about 2 miles of Bahía Honda; from there it is impassable (practically), though a wagon track here and there shows that wagons do sometimes traverse this portion; the bad spots being short could be repaired without great difficulty, but it is believed that this road may be left out as being impracticable for wagon transport.

After following generally a ridge skirting the south of Cabañas, town and bay, the road—now a tolerable cart road—runs more inland, or rather the coast runs out into a long point west of Cabañas.

$1\frac{1}{4}$ miles.

Descending the hill on which Cabañas stands, the road crosses a rivulet by a wooden bridge. (There is a ford here; the creek is about 6 feet wide and $1\frac{1}{4}$ feet deep.) A hundred yards or so beyond a byroad passes to the left, probably going to cane fields. Main road continues over low ground and through much cane to a sugar mill, a mile or a mile and a half from Cabañas. On a low hill just beyond is another hill and house, and here a road to the right, main road descending to the foot of the hill. Then crosses a small rivulet and ascends another hill, to the left of which flows a little sparkling creek. The country is now open and rolling, as it has been constantly, producing cane, almost the only crop, a little corn perhaps, and vegetables near the houses, but no tobacco. Cane, sugar mills, and palms, with now and again

fine grass, when the ground is not covered with cane. About 2 miles from Cabañas a few huts, but they are usually plentiful enough. The road is now, as it has been, a good, hard, dirt road, much traveled by wagons, and, as a rule, wide enough for two to pass. No doubt it becomes muddy in wet weather, as the ruts indicate, but good in dry season. As a rule, wagons or cavalry could march along side, but not always. The grades steep in places.

Distances from
Cabañas.
2 miles.

A little posada, or drinking place and store, on the road, and from here can again be seen Cabañas away to the right. A few hundred yards beyond this a road branches to the left, probably running down to the bay, and a few yards farther on another to the right; both may go to the island on which lies the fort mentioned. The road ascends a very steep, but not impassable hill; ropes might have to be used with very heavy wagons. The road itself, though bad, was passable for wagons without very great difficulty, and is used by them. The road reaches the town of La Bahía, which lies on the high ground, perhaps a mile and a half from the bay and on a continuation of a line through the entrance. Near the entrance to the town a road runs to the right. The road here is hilly and difficult, but passable for, and used by, wagons. It continues on over a broken ridge, with a wide valley to the left, broken and cultivated. To the right are rounded, cultivated hills, descending toward the bay.

3 miles.

4 miles.

Continuing along the ridge the road forks, the left descending to the southern valley, while the right road descends toward the bay. The left-hand road is less and less used as it advances into a valley containing grass and cane, some cattle, and huts to the left. About 3 miles away is a range of mountains, wooded with palms.

5 miles.

The ridge still following this valley reaches a fine brook, some 10 feet wide (called here a river), of clear water running over gravelly bottom; hard, with low shelving banks; no bridge, and water perhaps 2 feet deep. To the left and right were large cane fields, and to the left and front is a large house, evidently the residence of a sugar planter, with smaller houses around it. Here ends a small sugar railroad running down to Cabañas Bay.

The left-hand road joins the main road, making a detour of about 3 miles, and making on the main road perhaps 1½ miles, and striking it at a point where a small rivulet is crossed by a wooden culvert; here again the telegraph is seen, which probably follows the main road throughout; no doubt the main road is passable for wagons to this point. The road now a good wagon road, ascends a hill planted with cane; passing on to the left a reservoir of stone or cement filled with water, for use of the sugar mill and settlement close by. From the hill Cabañas Bay can be seen again some 2 or 3 miles to the right. There is now much cane and many mills.

6½ miles.

- Distances from
Cabañas.
- 7½ miles. The road reaches a large sugar mill, with fine vegetable gardens, a railroad to the bay, and many carts, chiefly of the large kind used for oxen. These could be used for mules with a little alteration. A few hundred yards beyond is a rivulet and wooden culvert. The road little used by wagons, though there are tracks that show it to be passable. The road runs as usual over hills with miles of cane on all sides, covering hilltops dotted with palms. The valley on right, however, toward the bay, grows more wooded and less cultivated. The road is here following a ridge, and in places becomes bad, steep, and rocky, but the bad places are short and could readily be repaired. The wagon tracks continue. The road reaches a house and another well-worn road, continuing through bars to the right toward the head of the bay. The latter seems a private way. The main road is now a good highway much traveled.
- 8 miles.
- 9½ miles. The main road forks, the left branch leading to Bahía Honda. Here it descends a steep hill to a cabin. The road now is much used, good but steep in places. At the foot of the hill is a little rivulet, and just beyond the road becomes very narrow, hardly wide enough for a wagon, and runs through a cut.
- 10 miles.
- 11 miles. The road passes the end of the bay, the coast beyond running far north in a long point. (It is to be remembered that one can not see long distances in Cuba, and what seem long distances are quickly passed.) The country to the right, though still producing much cane, is wilder than before, but there are many sugar mills in that direction. A few hundred yards beyond a road turns off to the right, the main line continuing to the left, still followed by the telegraph; deep ruts show mud in wet weather.
- 11¼ miles. Far away to the left and in front rise sharp mountain peaks, while some 8 miles across the valley to the left lie heavily wooded hills. The road crosses a small creek, where another road branches to a sugar mill to the right. Main road ascends a hill, and just beyond crosses a rivulet in a hollow. This place would become a bad mud hole in wet weather. A few hundred yards beyond, a road turns back on the right, probably to the same mill. Main road is now lonely and little traveled.
- 12 miles. A pretty, clear, mountain stream, perhaps 10 feet wide, a foot deep, with gravelly bottom, hard, low, shelving banks, a good ford, and no bridge; water is good for drinking. Near this stream the road probably becomes muddy in wet weather; it now lies in a valley, with wooded hills half a mile to the left.
- 12½ miles. A crossroad to sugar mills, several of which are near, and a quarter of a mile beyond, a very clear rivulet, which makes a mud hole where it crosses the road. The road for a little distance now becomes more level, and is shut in partly by

hedges. To the left lie large wooded mountains, but a little way beyond, say 15 miles from Cabañas, are again reached hills covered with cane. A fine sugar mill, one of the best seen, not as dilapidated as usual. These mills all have fine machinery. Just beyond the mill a road leads to the right. The Bahía Honda road, running up a steep hill to the left and some 100 yards from the other, again forks. This time main road runs to the right, the other descending a valley to the left. To the left rise a few cleared, rounded hills, behind them others uncleared. Road crosses a stream with low banks, no bridge, and a ford, probably always good. Beyond this are low places, at times no doubt muddy. The country on either side is now little cultivated, but there is much good grass on the hills. The road is now bad, though passable for wagons and with wagon tracks. There is plenty of water about. The road continues through cuts and hedges of brush or cactus.

Distances from
Cabañas.
14 miles.

The road becomes narrow, but wide enough for one wagon. It is rocky and bad. A short distance beyond where this cut ends, another begins; the country grows more open, but there is no cane. The road crosses another little rivulet. Near by are some huts, but it continues bad. A little cane is growing here. The hills in general are covered with palms and bushes, and grass is plenty. The road reaches the foot of a steep hill, where it becomes very bad. To the right from the summit can be seen the gulf and the bay of Bahía Honda. Now all around are sloping valleys; road is very high; from here to the outskirts of Bahía Honda the same.

18 miles.

18½ miles.

19½ miles.

The road may be said to be practically impassable here for wagons, though very faint tracks are seen throughout and the bad parts of the road could be repaired without great difficulty, and the road made practicable for wagons from Cabañas. The hills are now generally wild and brush covered. Continuing the ascent over very bad roads the summit is crossed. The road is now surrounded on the north by brush and palm-covered mountains, or high hills, uncultivated generally, while to the right—the north—is the Gulf far distant. Descending toward the west the road continues very bad and becomes again practically impassable on account of the steep, rocky, broken descents. These places could be repaired without much labor and are short. The roadbed is generally of rock, seemingly soft.

20 miles.

The road descends again to a cultivated country, where there is much cane; near here it crosses a clear brook about 6 inches deep, 8 feet wide, good ford, hard gravelly bottom, low banks, no bridge. The road is now better, but still bad, chiefly on account of the ruts made in wet weather. It is here inclosed by hedges or fences, sometimes of wire. The road descends the rocky slopes to Bahía Honda, about 21½ miles from Cabañas.

21 miles.

21½ miles.

ITINERARY OF ROAD ACROSS MOUNTAINS FROM BAHÍA HONDA
TO CANDELARIA.

Leaving Bahía Honda by a road at right angles to that from Cabañas, the road to the interior runs straight to the mountains and at once begins to ascend.

Cart tracks indicate that ox carts penetrate this far, probably for the purpose of bringing out a sort of bark shed from the royal palm tree, much used for the sides of huts.

The road grows rapidly worse; creeks, rivulets, and small rivers become frequent. The road leads into a mountain range covered with palms and other trees, among which the *ceiba* is the best known. After leaving Bahía Honda there are no clearings, the road running up and down steep declivities. This is supposed to be the good portion of the road, and is so called for a stretch of two leagues. The remaining six leagues are very bad indeed.

About 5 miles from town the road crosses a river of good water flowing at the base of a regular conical peak. None of the rivers are deep, and there is no difficulty in crossing any of them on this road.

To the left of the road at this point there is a site that would answer well for a sanitary camp. Here are the ruins of an old stone building that may have been a sugar camp, surrounded by a few thatched huts. A considerable portion of the rounded hill tops is cleared, and though the grass is not overabundant, there is sufficient for a considerable number of animals. Near by is a stream that would furnish water for a city. The place lies in an amphitheater of hills densely wooded and covered with brush. The locality is high and probably healthy. By the roadside stand the ruins of an old stone bath house built on a little stream coming from sulphur springs. There is earth enough here to erect a work that might be necessary for a sanitary camp. It could be attacked only by infantry, and possibly mountain guns.

Provisions can be brought from Bahía Honda by pack train, though the road could be readily made passable for carts to this point. The hills surrounding the spot are perhaps half a mile away. About a quarter of a mile from here a house is perched up on a hill above the trail, and from it a grand view may be obtained of the mountains and forest, extending as far as the bay, beyond the entrance to which the blue waters of the gulf are plainly seen. The house is no doubt visible from the sea, and communication could be established by signals between these points. It is reported that this place has been a camp for the troops in the rebellion. It would make an excellent sanitary camp. A large force could be kept here only by occupying the surrounding heights. The house is safe.

Beyond this place the road becomes very bad, and is said to be fit only for birds and the little Cuban horses. The road grows continually worse, running over mountains, through jungles, and forests, with low-hanging vines, through streams, over rocks and mud, and between steep banks.

After a long stretch of this kind of road, a long grassy slope is reached. Here the road turns and continues for some distance parallel to the range of mountains.

Another stretch of about 8 miles through the mountain and over the last range takes the traveler into Candelaria.

ARTEMISA-ALQUIZAR ROAD.

ITINERARY OF ROAD.

The dirt road passes the railroad station of Artemisa and leaves the calzada at right angles. Distances from Artemisa.

The road crosses the railroad track, the latter now lying to the left. The road is a good dirt road over rock, rough, and with here and there a little mud. These roads of rough rock, with dirt lying in between, become very bad in wet weather on account of the holes, out of which it is nearly impossible to drag the wheels. The rock here, as elsewhere, is the soft white limestone. The road is wide enough for two wagons to pass each other. Two hundred to 300 yards farther on the road improves a little. 0.5 mile.

Railroad track about 500 yards to the left. The road is now a good wagon road, wide enough for four wagons to march abreast. The road runs to the left, while a broad one runs off to the right. A hundred yards farther on the road forks again, one turning off at nearly right angles to the right. The country is flat and cultivated on both sides. The road still continues through rocky parts, but is, on the whole, good, though probably muddy in the wet season. 1 mile.

An embankment that looks as though intended for a railroad. Troops could move anywhere. The road here is excellent, smooth and hard, and of reddish dirt. 2 miles.

A road turns off to the right. The railroad is visible here about 500 yards to the left. The intervening country is good. Farther on the road and track approach each other. 2.5 miles.

A road crosses the railroad and enters the town of Las Cañas. At the farther end of the town a railroad runs to the left toward the mountains. The route nearly follows the railroad, now on the right, and continues nearly due east. Beyond Las Cañas the railroad runs some 500 yards to the right of the road. 3.5 miles.

The road stops at a house and a road crosses running nearly north and south. Here the route runs to the right, but probably the north is the correct one. The road, a good one, runs at about right angles with the railroad, whose tracks it crosses some 5 miles from Artemisa. The road now gradually turns 5 miles.

Distances from Artemisa. to the eastward, leaving the railroad on the left. The track

is not again seen until near Alquizar. The country between these two crossings is so bad as to be practically impassable for troops, brush and pointed rocks coming up through the ground, which would make it difficult for even a skirmish line to be extended across here, and communication maintained. The road becomes worse, less and less used, and is badly cut up by cart tracks. On either side are cactus hedges. The road becomes rougher and more rocky, still not very bad. It would, however, be almost impassable for troops in wet weather, and the nature of the country would not permit of going off the road. The road is a succession of rocky slopes, but might be greatly improved by corduroying with brush, of which there is plenty along the roadside.

5.5 miles. A road to the left at right angles, while the main route continues to the south.

6 miles. A small banana plantation; road continues through brush. The road curves gradually to the eastward. A few hundred yards a road enters from the right. The road continues rough, rocky, and through the brush.

7 miles. A house is reached, and a road to the left that runs nearly due east. The main route now follows this road to the east. The country is now more open, but the road still rocky, running between stone fences, and now wide enough for three wagons abreast.

8 miles. A road crosses. The main road still continues about due east. The road is now slightly better, with open country, less brush, but still little cultivation.

9 miles. The road runs between stone walls. From now on, the road and the surrounding country is somewhat improved.

9.5 miles. A road leaves the highway, going to the right, the main road going on a little north of east.

10 miles. A road leaves to the left, the main route going on, as before, a little north of east. Somewhat more cultivation, huts more frequent, and country more open. Just beyond here a road little used runs to the right between stone walls and through dense brush.

11 miles. A road to the right. The outcrop of rock still continues, but the country is somewhat more open.

11.5 miles. Stone walls, meadows, and houses. The road here makes a sharp turn and runs east, and becomes somewhat better.

12 miles. Sugar-cane huts and cultivation appear. The road now grows fairly good, and here again turns sharply north for a short distance. A little beyond this the railroad is crossed again. The railroad is now on the right. The road continues fairly good, but there is still some rock. For some hundreds of yards it runs nearly 90 degrees with the railroad.

13 miles. Strikes another road and stops. The route turns into this new road to the right, going east. A few hundred yards beyond the turn there is a crossroad which continues beyond

through a country that shows evidence of deep mud as well as of much travel.

Of the road from Artemisa to Alquizar, about 7 miles of it are so bad that it is practically impassable for wagons, although they could be sent over it. Foot troops could pass readily, and so could cavalry. The other road to Las Cañas is probably better, being more worn. The country is here often treacherous in appearance; what looks like fine level meadows with grass a foot high will often be found to be beds of sharp-pointed rocks that a horse can hardly walk over. The distance from Artemisa to Alquizar is probably 12 to 13 miles.

JUDICIAL DISTRICTS, TOWNSHIPS, CITIES, AND TOWNS.

Judicial district (partido judicial).	Townships (ayuntamientos).
I. Guanajay -----	{ Artemisa. Bahía Honda. Cabañas. Cayajabos. Guanajay. Guayabal. Mariel. San Diego de Nuñez. Baja.
II. Guane -----	{ Guane. Mantua. San Juan y Martínez. Alonso Rojas. Consolación del Norte. Consolación del Sur.
III. Pinar del Río -----	{ Pinar del Río. San Luis. Viñales. Candelaria. Mangas. Palacios.
IV. San Cristóbal -----	{ Paso Real de San Diego. San Cristóbal. San Diego de los Baños. Santa Cruz de los Pinos.

I. JUDICIAL DISTRICT OF GUANAJAY.

Population, 59,000; area, 468 square miles.

Townships.	Population.
1. Artemisa	8,477 (5,980 white; 2,497 colored).
2. Bahía Honda	8,584.
3. Cabañas	2,057.
4. Cayajabos	8,129.
5. Guanajay	9,491.
6. Guayabal	6,151 (5,809 white; 842 colored).
7. Mariel	9,198 (5,609 white; 3,589 colored).
8. San Diego de Nuñez.....	4,128.

1. AYUNTAMIENTO OF ARTEMISA.

Capital, Artemisa.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Cañas (Las)	5	Western Railroad station and post office.
2. Puerto de la Guira....	4	Is a harbor and has a post office.

ROUTES TO ARTEMISA.

1. From Habana by Western Railroad, via Rincón.
2. By macadamized pike from Marianao, via Guanajay.

ARTEMISA is a town of 2,049 inhabitants (1,816 white and 733 colored), situated 10½ miles from Guanajay. It is on the main line of railroad between Habana and Pinar del Río, about 35 miles from the former, and is also on the Mariel-Artemisa trocha. There is good foliage, and it is said to be a rich town. The houses are low and irregularly scattered over a flat region. They are built of brick, of stone, and of tile. The place is probably unhealthful. Artemisa is a point of strategic importance. It is connected with Guanajay by a calzada 12 miles long, over which communication is maintained by carriages. Guanajay is the terminus of the Habana Railroad, and also a point of meeting of the Mariel-Cabañas calzada with that of Habana to San Cristóbal. Artemisa is without defense, and could not easily be defended. There is no high ground of much importance in the vicinity. Troops can be landed near the station, at the crossing of the railroad and the calzada. It has 46 cattle farms, 2 sugar mills, and 301 agricultural farms. It has a bureau of statistics, a board of education, a health department, post office, and telegraph station. The Western Railroad station is some half mile beyond the limits of the town, but is connected by a good dirt road. The distance to San Cristóbal is about 22 miles.

2. AYUNTAMIENTO OF BAHÍA HONDA.

Capital, Bahía Honda.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Agnacate	7	Port at Morrillo.
2. Barrio-rural	16	
3. Corralillo	10	
4. Manimani	7	Third-class port. Harbor and post office.
5. Mulata (La)	16	
6. Pozas (Las)	12	
7. San Miguel	6	

ROUTES TO BAHÍA HONDA.

1. From Habana to Guanajay, by United Railroad, via Rincón, then by macadamized pike, via Mariel and Cabañas.
2. By Western Railroad to San Cristóbal, then by road over the mountains.
3. From Habana by water.

BAHÍA HONDA is a port of 1,889 inhabitants, situated 37 miles from Guanajay and 55 miles west of Habana. The largest part of the population is of negro blood. The nearest railway station is San Cristóbal, 25 miles distant. Bahía Honda has a telegraph station and a post office. Two miles north is the harbor of Bahía Honda, which is one of Cuba's fifteen harbors of the first class. It is 5 miles long by 3 miles wide, and is the most western of the first-class harbors. It is not a port of entry.

The town, founded in 1779, is quite hidden from the sea and bay, lying as it does back from the hills which border the low ground around the western, southwestern, and southeastern parts of the bay. It is 50 feet above the level of the sea, and is "ill ventilated because surrounded by hills." Yellow fever averages about 92 out of 1,000, which is remarkably small for this portion of the country. This has been attributed to the "smallness of the garrison, composed generally of acclimated soldiers," and to the fact that it is not a seaport, and therefore has no intercourse with infected places.

The road from the town to the bay runs through hills, usually cultivated with cane. It is undulating, passing through cuts at times, and it is unpaved, although wide enough for two or three wagons to pass. It becomes muddy and probably impassable in wet weather.

From the crest of the hill a good view is obtained of the bay. Around the bay the ground is low in the direction of the town. There is a little wooden wharf some quarter of a mile to the right, but no settlement to speak of. There are no roads, so far as can be seen, running around the bay to the right and left, i. e., heading the low ground. About half a mile from the bay to the town the road runs nearly north and south. The fort is on the right of the entrance three or four miles away. It must be difficult to reach by road, and a bad landing place, for the low ground extends far to the east or southeast.

Hills command places where troops must land, and on them is plenty of earth for earthworks; there is a good cover behind the hills for infantry. In fact, a landing at Bahía Honda and an advance to the town could be most strongly contested, if not defeated; and once in the town, foreign troops would be at the mercy of an opposing force which knew the country, thus giving time for troops to concentrate on Western Railroad at San Cristóbal or Candelaria, and at Cabañas, and preventing any attempt made to get out of Bahía Honda.

A great deal of sugar is raised here, but no tobacco. The most important sugar mill is just west of the harbor.

SAILING DIRECTIONS.

BAHÍA HONDA is a small, well-sheltered harbor, with a depth of from 3 to 6 fathoms. Its entrance, however, is so narrow and intricate that a pilot is necessary in the absence of good local knowledge. The shore on either side of it is low and sandy. On the east side of the entrance is the small hill of Morrillo. The channel is about 2 miles in length, north and south, and opens out into a land-locked basin, about a mile in diameter, but the interior is only fit for small vessels. From the base of the Morrillo a coral ledge runs off $\frac{1}{2}$ mile to the NW.; and from Pescadores Point, on the opposite side, a similar ledge runs off 600 yards to the NE., and the navigable channel here between the banks is not more than 300 yards wide.

From the Morrillo the shore trends SW. about $\frac{1}{2}$ mile to Real Point, and the distance across to Caiman Point, on the western shore, is about 600 yards. The former point may be approached to about 150 yards, and the latter to 100 yards. From Real Point the eastern shore trends south nearly $\frac{1}{2}$ mile to Carenero Point, and $\frac{1}{2}$ mile to the southward of this is a low mangrove cay called Largo, the west end of which, Difuntos Point, is seen from the entrance. This point is foul to the NW. for 400 yards, and the channel is here again narrowed to about 400 yards by this and the sand bank $\frac{1}{2}$ mile off the western shore. Within this is the basin.

The town is 6 miles from the bay. It has a fort, which is a good mark for entering. The health of the place is good, except in the sickly season, which commences in April and lasts through the summer.

Directions.—To enter the harbor, bring the entrance to bear south (S. 4° E. mag.) and steer for it. When within the distance of one mile Difuntos Point will be seen between the sandy points on either side of the entrance, and beyond it a remarkable hill, with a square top, back of a sugar estate. By keeping the eastern end of this hill on with Difuntos Point a depth of 16 to 5 fathoms will be carried in. The eastern side of the entrance should be kept close aboard, and when abreast of Carenero Point a vessel may anchor in 6 fathoms of water, or, if it is desired to proceed farther in, she may stand to the SW. and anchor just within Difuntos and Mangles Points. Placer Point should be given a good berth, as a sand shoal just awash lies $\frac{1}{2}$ mile off it. Sailing vessels must wait for the sea breeze to enter, and for the land breeze to leave Bahía Honda. Although several streams enter into the harbor, good water can not be obtained in great quantity.

From Bahía Honda to Cabañas the shore should not be approached nearer than 2 miles.

Reef.—The American schooner *Hattie Weston* struck on a reef in latitude $23^{\circ} 06' N.$, longitude $83^{\circ} 04' W.$, at an estimated distance of 5 to 7 miles off shore. This shoal had been searched for without success, but as the *Hattie Weston* had to discharge cargo in order to get off, there can be no doubt of the existence of a shoal in this vicinity, though the position given may be wrong.

3. AYUNTAMIENTO OF CABAÑAS.

Capital, Cabañas.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Ensenada de Amiot....	6	Montato tortoise-shell factory.
2. La Bahía	4	
3. San Pedro (Playa de) ..	9	
4. Vija	3	

ROUTES TO CABAÑAS.

1. From Habana by United Railway to Guanajay, thence by macadamized pike, via Mariel.

2. By sea from Habana to Mariel, then by pike.

CABAÑAS is a port of 1,454 inhabitants, situated 22 miles from Guanajay. It is located on the east bank of the harbor of Cabañas, a harbor of the second class, of which the dimensions are about 4 by 7 miles. At the entrance of the bay is the fort Reina Amalia.

The town, founded in 1818, is on the north coast, about 38 miles west of Habana and between Mariel and Bahía Honda. It is not a port of entry, and is of no importance commercially or otherwise. It has a telegraph station and a post office.

According to the military tables there was no yellow fever here from 1860-67, except in 1865, when there were twenty cases. It has been said that "yellow fever has no particular fondness for this place."

LA BAHÍA is a village on the road from Cabañas to Bahía Honda, about 4 miles from the former. The town lies on high ground, perhaps a mile and a half from the bay, and on a continuation of a line through the entrance. The little place is perched on the first high ridge from the bay, and overlooks it. It consists of only a few houses, though there are many huts straggling along the roadside.

SAILING DIRECTIONS.

Cabañas is a good and well-sheltered anchorage, and vessels of large draft may safely enter it. South of the port, 5 miles inland, there is a range of mountains 1,400 feet high at the western part, sloping gradually toward the eastward to a large plain extending as far as the table land of Mariel. At the eastern end of the heights there is a remarkable peak bearing S. 45° E. (S. 49° E. mag.) from the entrance to the harbor, and about the middle of the range there is a remarkable gap.

On the eastern side of the entrance there are two small hills, on the western part of which are the buildings of a sugar estate. The entrance

is $1\frac{1}{2}$ miles wide, and when it bears south (S. 4° E. mag.) a guardhouse or tower with several adjacent buildings will be seen 2 miles inside. This tower is on the extreme of an islet called Don Juan Tomas Cay, which divides the harbor into two large arms.

A coral ledge extends off upward of $\frac{3}{4}$ mile from the weather shore and 400 yards from the lee side, leaving a channel about 600 yards wide.

Directions.—When steering for Port Cabañas, having opened out the tower, bring it to bear about S. 8° E. (S. 12° E. mag.), when it will be in one with a remarkable gap on the heights above. This mark will lead to the entrance of the channel in from 16 to 9 fathoms water, over sand. When the first point on the western coast, called Arbolitos, bears N. 86° W. (west mag.) the depth will decrease to 7 fathoms; then alter course to S. 18° E. (S. 17° E. mag.), carrying 6 to 4 fathoms in midchannel, and the water will deepen to 13 fathoms on nearing Pescadores Point. With the gap open a little to the eastward of the tower, a vessel will carry in 22 feet water; and with it open to the westward, double the breadth of the tower, she will have 20 feet.

Having passed Pescadores Point, haul up and anchor close under the weather shore in 7 to 9 fathoms, mud, near the entrance of the SE. arm; or keep away and come to in the SW. arm, in about 9 fathoms water, under the lee of the tower. In doing this, however, be careful to avoid a patch of rocks and sand, about 250 yards in extent, and on which there are $2\frac{1}{2}$ fathoms water; it lies nearly $\frac{1}{4}$ mile N. 1° W. (N. 5° W. mag.) of the tower, and may be seen from aloft.

Caution.—In leaving the harbor it will be desirable for a sailing vessel to weigh with the early land wind, to insure its carrying the vessel well out before it fails, as there is generally a very heavy swell in the offing, and frequently a strong SW. eddy, which might set her on the reef skirting the shore.

There is telegraphic and postal communication with Habana by land. There are several streams of fresh water, but not very good. Salutes can be returned by the fort. The authorities to visit are the commandant of the fort and the alcalde.

The district is rich and fertile and occupied principally by sugar estates.

Between Cabañas and Mariel, 12 miles to the eastward, the coast is, in places, bordered by a reef $\frac{1}{4}$ mile off shore. The edge of the reef is steep to, and, as there is frequently a strong eddy to the SW., vessels must take care not to get becalmed in this vicinity.

4. AYUNTAMIENTO OF CAYAJABOS.

Capital, Cayajabos.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Chacon	9	
2. Jobo	6	
3. Rosario	30	

CAYAJABOS is a town of 1,353 inhabitants, situated 12 miles from Guanajay. Post office.

5. AYUNTAMIENTO OF GUANAJAY.

ROUTES TO GUANAJAY.

1. From Habana by United Railway, via Rincón.
2. By macadamized pike from Marianao.
3. By water to Mariel and thence by pike.

GUANAJAY.—This inland town is about $7\frac{1}{2}$ miles south of the port of Mariel, and some 30 miles by road southwest of Habana, with which it is connected by railroad. It has a post office and telegraph station. Population, 5,792.

It is about 9 miles northeast from Artemisa, with which point it is connected by a calzada, over which communication is maintained by means of carriages. Guanajay is the terminus of the branch of the Habana railroad and a point of meeting of the calzada from Mariel and Cabañas with the main calzada from Habana to San Cristóbal. It is on the Artemisa-Mariel trocha, 82 miles from Pinar del Río. Yellow fever has never prevailed here to any great extent.

6. AYUNTAMIENTO OF GUAYABAL.

Capital, Caimito.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Banes y Quintana	8	1,720 inhabitants. Post office.
2. Guayabal	5	1,334 inhabitants.

CAIMITO, the capital of the jurisdiction, situated 6 miles from Guanajay, has a population of 1,788 (1,378 white and 410 colored). The town of Caimito is a small collection of huts lying chiefly along a highway, which is here only a few hundred yards away. It is of little importance, affords very little shelter, and no supplies of consequence are to be anticipated here. However, the country in the vicinity appears very fertile, sugar cane being the chief product. It is well stocked, and seems to have abundant water in the pond lying near. This water is probably good, as water found in the lakes and streams of Cuba is invariably of fine quality.

7. AYUNTAMIENTO OF MARIEL.

Capital, Mariel.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Boca	2	
2. Macagual	$\frac{1}{2}$	
3. Molina	4	
4. Mosquito	2	
5. Quiebra-Hacha	7	
6. Rayo	4	
7. Sábana	$3\frac{1}{2}$	
8. San Juan Bautista	$3\frac{1}{2}$	

ROUTES TO MARIEL.

1. From Habana by water.
2. By United Railways to Guanajay and then by pike.

MARIEL is a seaport fitted with quarantine, with 1,637 inhabitants (1,060 white and 577 colored); it is situated $7\frac{1}{4}$ miles from Guanajay and 28 miles by road west of the city of Habana.

The town, founded in 1762, is located on the east bank of the first-class harbor of Mariel, but it is not a port of entry. It is a place of no commercial importance and has no railroad communications.

From Mariel to Guanajay there is a fine road, though not macadamized, which was wired and ditched by the Spaniards and formed part of the Mariel-Artemisa-Majana trocha. There is said to be an excellent landing place at the mouth of the Mosquito River near the port of Mariel, and by disembarking at the latter place the landing party might take possession of the hills behind Mariel and those commanding the important town of Guanajay. This place has been quite free from yellow fever except in the year 1861 when there were 113 cases.

SAILING DIRECTIONS.

PORT MARIEL.—The shore in the vicinity of Port Mariel becomes a little more elevated and a short distance inland, to the eastward of the port, there is a remarkable long flat ridge of tableland of moderate height, with a notch or step at its east end, called the Table of Mariel, which can not be mistaken, and a little westward of it will be seen a remarkable cliff, facing westward in the harbor. The entrance lies NW. from the west end of the table, and on its eastern side there is a martello tower and some huts, and when the tower bears S. 6° E. (S. 10° E. mag.) a church and several buildings will open out in the interior.

The port is well sheltered, but its entrance is only 50 yards wide. The least depth is 4 fathoms. The eye will be the best guide in entering, and when within the narrowest part keep the weather shore aboard until abreast of Gorda Point, on the west shore, on which there is a small fort, when the vessel may anchor in 5 or 6 fathoms in safety.

Cattle can be obtained at the sugar estates, but no provisions. Water can be obtained from the fresh-water streams. It is generally healthy, the sickly season being from April to September. The battery at the fort can return salutes. There is telegraphic communication, also a railroad, to Habana. There is a small police force. Pilots are not necessary.

Buoys and Beacons.—On the weather or eastern side of the entrance are two buoys, one on Los Cabazos abreast of Point Barlovento, the other farther in on the most projecting point of the shoal water. On the western side of entrance there is a beacon on Cayuelo, 14½ feet high, surmounted by a ball, next a buoy on the edge of the shoal, which, with the buoy opposite, marks the narrowest part of the channel; there is also a buoy on the NE. extremity of the reef off Regla Point.

8. AYUNTAMIENTO OF SAN DIEGO DE NÚÑEZ.

Capital, San Diego de Núñez.

Outlying village.	Distance from capital.	Remarks.
1. Carenero	<i>Miles.</i> 9	

SAN DIEGO DE NÚÑEZ is a town of 627 inhabitants, situated 32 miles from Guanajay. It has a post office.

II. JUDICIAL DISTRICT OF GUANE.

Population, 46,268.

Townships.	Population.
1. Baja	4,640 (3,536 white and 1,104 colored).
2. Guane.....	25,000.
3. Mántua	8,000 (6,000 white and 2,000 colored).
4. San Juan y Martínez.....	19,000.

1. AYUNTAMIENTO OF BAJA.

Capital, Baja.

Outlying villages.	Distance from capital.	Population.
	<i>Miles.</i>	
1. Bartolo.....	6	685.
2. Francisco	14½	676.
3. Macuriges	13	663.
4. Malas Aguas.....	18½	393.
5. Nombre de Dios	10	679.
6. Peña Blanca.....	15½	88.
7. Pimienta	18½	640.

BAJA is a town of 201 inhabitants (86 white and 115 colored), situated in the western part of the province near the north coast, 45 miles from Guane.

2. AYUNTAMIENTO OF GUANE.

Capital, Guane.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Cabo		
2. Catalina	6½	
3. Cortes	9½	
4. Grifa	18	
5. Juan Gómez	4	
6. Martinas	18½	
7. Paso Real	2½	
8. Portales	4½	
9. Punta de la Sierra	5½	
10. Remates	19	
11. Sábalo	10½	
12. Serranos	18½	
13. Tenería	7	
14. Trinidad	5½	
15. Santa Teresa	7½	

GUANE is a city of 510 inhabitants, situated 37 miles from Pinar del Río. It is on the Cuyaguataje River, which is navigable for 9 miles. The nearest station is Pinar del Río. Guane is the terminus of the calzada. It has a post office and telegraph station.

SAILING DIRECTIONS.

PORT FRANCES.—From Perdenales Point the coast trends about NNW. 3 miles to Frances Point, the most western of the island, forming a bay called Port Frances. This bay is convenient for vessels stationed on the south coast of Cuba, affording good shelter during the strong trade wind. The anchorage is good all over the bay by selecting the white spots, as the water is very clear. The most convenient for getting under way is with the following bearings: Perdenales Point S. 19° E. (S. 23° E. mag.) and the NW. extreme of Bush Cay N. 33° W. (N. 37° W. mag.). A sand bank skirted by a coral reef, and very shallow, borders the north shore, and extends some distance round Bush Cay. There is good fishing with the seine on the north shore; spiny lobsters abound, and rays and alligators frequent the boat channels.

Water.—About 200 yards from the east end of the longest beach there are some wells of good water; but the ground being rocky the casks will have to be filled in the boat, or, if on the beach, rafted. There is good fishing in the bay, and wild cattle frequent the wells at noon and in the evening.

8. AYUNTAMIENTO OF MÁNTUA.

Capital, Mántua.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Arroyos	9½	
2. Cabezas	12½	
3. Ceja	13	
4. Guayabo	13	
5. Montezuelo	8	
6. San José	4½	
7. San Lázaro	2½	
8. Santa Isabel	10½	
9. Santa María	5½	

MÁNTUA is a town of 1,380 inhabitants (1,020 white and 360 colored), situated 18½ miles from Guane and 8 miles from the western shore of Pinar del Río. It is near the river Mántua.

4. AYUNTAMIENTO OF SAN JUAN Y MARTÍNEZ.

Capital, San Juan y Martínez.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Arroyo Hondo	-----	
2. Galafre	5	
3. Guillen	13½	
4. Lagunillas	-----	
5. Luis Lazo	-----	
6. Martínez	3½	
7. Puntas de Cartas	8	
8. Rioseco	6	

ROUTES TO SAN JUAN Y MARTÍNEZ.

1. From Habana to Pinar del Río by Western Railroad, then by pike.
2. From Habana by pike, via Guanajay, Artemisa, and Consolación del Sur.

SAN JUAN Y MARTÍNEZ is a town of 2,100 inhabitants, situated 23 miles from Guane, 16 miles from Pinar del Río, and about 3 miles from the southern coast. It has a telegraph station.

III. JUDICIAL DISTRICT OF PINAR DEL RÍO.

Population, 29,500.

Townships.	Population.
1. Alonso Rojas	4, 156
2. Consolación del Norte	8, 997
3. Consolación del Sur	16, 057
4. Pinar del Río	8, 000
5. San Luis	9, 125
6. Viñales	11, 729

1. AYUNTAMIENTO OF ALONSO ROJAS.

Capital, Alonso Rojas.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Almacigos	6	
2. Chamizo	6	
3. Huerta	4	
4. Palenque	7½	
5. Palizadas	1	
6. Palmarito	7	
7. Paso de las Mangas ..	8½	
8. Punta de Palmas	3½	
9. Roblar	2	
10. Ruiz	3	
11. San Francisco	3½	
12. San Lorenzo	6½	
13. Yamagues	4	

ALONSO ROJAS is a village of 196 inhabitants, consisting of scattered settlements and a rural population. It is situated 25 miles by road from Pinar del Río and 18 miles from Consolación del Sur, which is the nearest railroad station.

2. AYUNTAMIENTO OF CONSOLACIÓN DEL NORTE.

Capital, La Palma.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Arroyo Naranjo	$\frac{1}{2}$	
2. Caiguanabo	$9\frac{1}{2}$	
3. Jagua	9	
4. Puentes	$8\frac{1}{2}$	
5. Río Blanco	$5\frac{1}{2}$	
6. Río de Puercos	$7\frac{1}{2}$	
7. San Andres	$9\frac{1}{2}$	
8. Vegas Nuevas	2	

PALMA (LA) is a town of 626 inhabitants, situated 35 miles from Pinar del Río. The nearest station is Consolación del Sur, 22 miles away, and the Port Río Blanco is 7 miles distant. Post office.

3. AYUNTAMIENTO OF CONSOLACIÓN DEL SUR.

Capital, Consolación del Sur.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Caimito	$2\frac{1}{2}$	
2. Camarones	2	
3. Caperuza	5	
4. Hato Horcones	5	
5. Hato Quemado	5	
6. Jagua	4	
7. Lajas	5	
8. Lefia (La)	3	
9. Naranjo	$5\frac{1}{2}$	
10. Pilotos	6	
11. Río Hondo	3	
12. Sabanas Nuevas	$3\frac{1}{2}$	
13. San Pablo	2	
14. Santa Clara	$2\frac{1}{2}$	

ROUTES TO CONSOLACIÓN DEL SUR.

1. From Habana by Western Railroad.
2. By macadamized pike, via Guanajay and Artemisa.

CONSOLACIÓN DEL SUR is a town of 2,000 inhabitants, situated 13 miles from Pinar del Río and 12 miles from Paso Real. Next to Pinar del Río

it is the most important town in the region of Vuelta Abajo. It is on the main line of the Western Railroad from Habana to Pinar del Río. There is a terminal inn one mile away, with stage coaches during the business hours. It has more than 800 tobacco plantations, which produce tobacco of the best quality. Post office.

4. AYUNTAMIENTO OF PINAR DEL RÍO.

Capital, Pinar del Río.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Cabezas	12	
2. Cangre	3	
3. Colon	15	
4. Llanada	9	
5. Marcos Vazquez	10	
6. Obas	9	
7. Paso Viejo	4	
8. Río Feo	5	
9. Río Sequito	4	
10. Sumidero	18	
11. Taironas	3	

ROUTES TO PINAR DEL RÍO.

1. From Habana by Western Railroad.
2. By macadamized pike, via Guanajay, Artemisa, and Consolación del Sur.
3. From seaport of La Coloma by pike.

PINAR DEL RÍO is a city of 8,000 inhabitants, capital of the province and of the judicial district of the same name; it is situated in longitude 77° 27' 33" west from Cadiz and in 22° 23' 40" north latitude; about 150 miles south of Habana. It has a road connecting with the harbor of Coloma, by means of which traffic is carried on in the tobacco of Vuelta Abajo. The ground is silicious with base of alumina. Among the principal buildings are the parish church, the governor's residence, the hospital, and the theater. Pinar del Río dates from 1571, when Melchor Rojas founded the cattle farm of San Felipe and the corrals of Cangre, Guama, Pinar del Río, and Cabezas. The post office was established in 1834, and in 1836 Governor Salazar founded the first school. It has a board of education, a charitable organization, and a board of health. A railroad connects it with Habana. It has a post office and a telegraph station.

In this district there are no ports of entry and no maritime towns—only shipping piers, where travelers remain a very short time. The maritime border of this district is low and marshy, covered with mangroves, and uninhabitable.

The town is situated on the northeastern slope of a little hill which rises to the northwest, and reaches its highest point probably near the end of the main street, by the charity hospital, where the altitude above the sea is 160 feet. Toward the northwest and west, and extending far to the northeast, lie the mountains, which are not more than 4 or 5 miles away. The country intervening is rolling and parklike, dotted with palms. The pine barrens begin some 4 or 5 miles to the south of the city. The river on the outskirts has good water. There are said to be no Americans, English, nor Germans here, but there are a few French. The population is about half white and half black. Around the towns are cultivated fields, tobacco gardens, truck farms, etc. The roads leading to it from Coloma and from Consolación hardly rise at all, so small is the ascent to the eastern and central part of the town.

The streets are roughly paved. The houses are commonly of stone or brick, covered with stucco, with tiled roofs. They are sometimes flat, with railings, but more often sloping. The place could not be burned. There are good horses of the small Cuban type. The chief business is in the tobacco trade.

Yellow fever rarely shows itself here, and no data exists respecting past epidemics. Pezuela says that "In the town of Pinar del Río yellow fever occurs as a sporadic disease."

COLOMA is the port of Pinar del Río; the population is from 100 to 200 people, about half white and half black. The town consists of about twenty or thirty huts on a low sandy shore, covered with brush, small palms, and mangroves. There are also a few stone and brick houses in decay. The mouth of the river is as good a place for boat landing as could be desired, the water shoaling gradually and the shore sandy. The sand, however, is so scarce that earthworks could scarcely be constructed. There is a good wooden wharf a mile from the river's mouth. Connected with this wharf is a large wooden warehouse, probably 150 feet long, with a small track and car for transporting merchandise inside. At the farther end of the warehouse is the calzada. Probably 2,000 men could be sheltered here. The river at this point is from 600 to 800 yards across.

East of the river a long, low, brushy point runs out toward the south-east, but the channel of the river is marked by brush and poles far out toward the south and approaching the coast at about right angles. It would never be suspected that a highway landed at such a place. Approaching by water the place would be difficult to see, as there is a fringe of brush lining the seashore, and the river's mouth is small and inconspicuous. Coloma is a very good landing place for troops, having solid ground, shelter for stores, and being at the very end of the calzada. The channel appears to lead in directly from the south. The mouth of Coloma river is about 14 miles from Pinar del Río.

5. AYUNTAMIENTO OF SAN LUIS.

Capital, San Luis.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Barbacoas	3½	
2. Barrigonas	3½	
3. Llanada	9½	
4. Palizadas	10	
5. Río Seco	6½	
6. Tirado	7	

SAN LUIS is a town of 3,556 inhabitants, situated 10½ miles from Pinar del Río. It is near the San Sebastian River and about 4 miles from the calzada between Pinar del Río and Guane. It has a post office and telegraph station.

6. AYUNTAMIENTO OF VIÑALES.

Capital, Viñales.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Cayos de San Felipe....	5	
2. Ceja Ana de Luna	3½	
3. Esperanza (La)	4	It has a port known as Surgidero and a railroad to Soledad.
4. Laguna de Piedra.....	4	
5. San Cayetano.....	10	
6. Santo Tomás	5	

ROUTES TO VIÑALES.

1. From Habana to Esperanza by sea, thence by rail.

VIÑALES is a town of 925 inhabitants, situated 16 miles from Pinar del Río. It has mineral baths. It is at the terminus of a railroad running to the north coast 12 miles distant. Post office and telegraph station.

IV. JUDICIAL DISTRICT OF SAN CRISTÓBAL.

Population, 44,700; area, 747 square miles.

Townships.	Population.
1. Candelaria	6,087 (4,015 white; 2,022 colored).
2. Mangas	3,576.
3. Palacios	5,880.
4. Paso Real de San Diego	5,574 (4,020 white; 1,554 colored).
5. San Cristóbal	
6. San Diego de los Baños	8,211 (7,083 white; 1,128 colored.)
7. Santa Cruz de los Pinos	4,824.

1. AYUNTAMIENTO OF CANDELARIA.

Capital, Candelaria.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Baños de San Juan ---	6	600 inhabitants.
2. Barrancones	3	
3. Bayate	2	
4. Manantiales	4	
5. Río Hondo	5	
6. San Juan de Contreras	6	
7. San Juan del Norte ---	7	
8. San Juan del Sur	5	
9. Santa Clara		
10. Teneria	3½	
11. Trinidad		

CANDELARIA is a town of 1,200 inhabitants, situated 6 miles from San Cristóbal. It produces the best coffee of the island. There are many springs of mineral water among the hills of Cuzco, which have properties analogous to those of San Diego; and the river which is known as Manantiales forms a cataract 98 feet high.

The town is on the calzada between Habana and Pinar del Río, and is a station of the Western Railroad. It lies in a flat region, is entirely without defense, and is shut in by brush. The water supply comes from wells and cisterns, and there is no other than surface drainage. The greater part of the town lies north of the railroad depot. It is an active, prosperous place, with many shops. The houses are low, and chiefly of wood and stucco. It has 27 coffee plantations, 38 cattle farms, 184 tobacco plantations, and 5 agricultural farms. It has a board of public education, and a health department. Telegraph station and post office.

2. AYUNTAMIENTO OF MANGAS (LAS).

Capital, Mangas (Las).

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Guanimar	10	
2. Mangas de Río Grande ..	10	
3. Majagua	5	
4. Pijiriga	2½	
5. Pueblo Nuevo	2½	
6. Punta Brava	4	
7. San Juan	5.	

MANGAS is a miserable town of 209 inhabitants, situated 17 miles from San Cristóbal. It is on the calzada between Habana and Pinar del Río, 14 miles southwest of Guanajay. It is also on the calzada from San Cristóbal to Batabanó. The country is flat and bushy and the houses scattered. Post office.

3. AYUNTAMIENTO OF PALACIOS (LOS).

Capital, Palacios (Los).

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Bacunagua	5½	
2. Limones	8	
3. Macuriges	2½	
4. Palacios (Rural)	2½	
5. Santa Teresa		
6. Santo Domingo	5½	
7. Sierra (La)	7½	
8. Toro (El)	11	

PALACIOS is a town of 821 inhabitants, situated 18 miles from San Cristóbal on the calzada between Habana and Pinar del Río; Western Railroad station, post office, and telegraph station.

4. AYUNTAMIENTO OF PASO REAL DE SAN DIEGO.

Capital, Paso Real de San Diego.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Arroyo Colorado.....	7	
2. Caraballo.....	5½	
3. Ceja de Herradura....	9	
4. Guajairo.....	5	
5. Guira.....	10	
6. Hato de las Vegas.....	11	
7. Herradura.....	6	
8. Palacios.....	1	
9. Santa Monica.....	2½	
10. Soledad (La).....	2	

PASO REAL DE SAN DIEGO is a town of 494 inhabitants (405 white and 89 colored) situated 22 miles from San Cristóbal. Western Railroad station, and post office.

5. AYUNTAMIENTO OF SAN CRISTÓBAL.

Capital, San Cristóbal.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Bermejales.....	-----	
2. Guanacage.....	-----	
3. Mayarí.....	6½	
4. Minas.....	-----	
5. Santa Cruz.....	6½	
6. Sitio Herrera.....	1½	

ROUTES TO SAN CRISTÓBAL.

1. From Habana by Western Railroad.
2. By pike from Mariano, via Guanajay and Artemisa.

SAN CRISTÓBAL is a town of 3,522 inhabitants, situated 65 miles southwest of Habana, about midway between the northern and southern coasts. It has a municipal council, a board of education, a post office, and a telegraph station. The Western Railroad has a station here.

San Cristóbal is an old town, and is on the calzada from Habana, via Guanajay and Artemisa, a road probably built fifty years ago. It is nearly opposite the highest of the range of hills extending from Mariel westward, and some 3 miles from the foot. It lies on a low, hardly perceptible hill, is without defense, and could not be readily defended. The

houses are largely of stone or brick, covered with cement flat tiles. It is a breezy place with a pleasant open country around and is reported to be a healthful locality. It is a good place to debark troops, and the contiguity of the railroad and the calzada make it of strategic importance. There are no defensive hills worthy of notice in the vicinity.

CHIRIGOTA.—This town is $4\frac{1}{2}$ miles from San Cristóbal, on the railroad from San Cristóbal to Candelaria. The town is some $\frac{1}{4}$ of a mile from the railroad. A very pretty little place with tobacco and banana fields surrounding it.

6. AYUNTAMIENTO OF SAN DIEGO DE LOS BAÑOS.

Capital, San Diego de los Baños.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Dayaniguas -----	25	
2. Herradura (La) -----	6	

SAN DIEGO DE LOS BAÑOS is a town of 745 inhabitants (518 white and 227 colored), situated 25 miles from San Cristóbal. It has a settlement of sulphur baths which are open from February 15 to May 25. The nearest station is Paso Real, 9 miles distant. Telegraph station and post office.

7. AYUNTAMIENTO OF SANTA CRUZ DE LOS PINOS.

Capital, Santa Cruz de los Pinos.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Bermejales -----	2	1,432 inhabitants.
2. Santa Cruz del Norte--	2	1,029 inhabitants.
3. Taco-Taco Sur -----	1	983 inhabitants.

SANTA CRUZ DE LOS PINOS is a city of 1,244 inhabitants, situated 7 miles from San Cristóbal. The town is about $\frac{1}{2}$ mile from the railroad, and is probably not visible from the train on account of the brush. It has cattle and breeding farms. The town is of stone and frame houses, tiled. It has many little shops and a police force. Western Railroad station.

PROVINCE OF HABANA.

(195)

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TABLE OF DISTANCES, IN MILES, BETWEEN TOWNS IN PROVINCE OF HABANA.

[illegible]

PROVINCE OF HABANA.

LOCATION AND BOUNDARY.

The Province of Habana is, with the exception of Pinar del Río, the most westerly of the provinces. All of its territory is in the most northern part of the island, its most southern boundary being a much higher zone than the northern boundary of Santiago de Cuba.

The northern boundary is the Gulf of Mexico; the eastern, the Province of Matanzas; the southern, the Gulf of Matanzas; and the western, the Province of Pinar del Río.

AREA AND POPULATION.

The area is 2,265 square miles, only about one twenty-second of the area of the whole island.

The population is 452,000. There are 7 judicial districts (partidos judiciales), and 38 townships (ayuntamientos). These divisions comprise 6 cities, 4 towns, 25 villages, 180 hamlets and suburbs, with a total of 36,000 estates. This is the smallest province, but the most thickly populated.

ADMINISTRATION.

Habana is a first-class province, has a regional government, a general military and naval commander, a general and principal administration of roads and communications and finances, provincial deputation, 37 *alcaldes municipales* (mayors), 5 vicars, and 52 parishes. It has a civil and criminal court of justice, 12 courts of the first instance or inquiry, and 46 municipal courts. There is a harbor captaincy, and Habana is the capital of the naval district. It is also the residence and official center of all civil, military, and religious employees. The 12 courts of the first instance are the Western, Central and Eastern, Belen, Cathedral, Guadalupe, Jesús Maria, Pilar and Cerro, Marianao, Guanabacoa, Jaruco, San Antonio de los Baños, Bejucal and Güines. The municipal courts are Habana, Marianao, Bauta, Cano, Guanabacoa, Managua, Regla, Santa María del Rosario, Jaruco, Aguacate, Baintoa,

Casiguas, Jibacoa y San José de las Lajas, San Antonio del Río Blanco, Tapaste, San Antonio de los Baños, Alquizar, Ceiba del Agua, Guira de Melena, Verida Nueva, Bejucal, Batabanó, Quivicán, Santiago de las Vegas, Nueva Gerona on the Isle of Pines, La Salud, San Antonio de las Vegas, San Felipe, Güines, La Catalina, Madruga, Pipian, Nueva Paz, San Nicolás, Guara, and Melena del Sur.

PUBLIC INSTRUCTION.

The Province of Habana has the University of Habana, established in 1728; a provincial college institute whose students number 1,752; a military school; a school of art; and a normal school, all of which are located in the city of Habana. Distributed throughout the entire province are 216 municipal schools, numbering 14,724 pupils. Besides this, there are many second-class colleges and 364 private schools. Most of the principal cities in the province have a board of education, but there is a board of education for the whole province located at the capital city. This province is the educational center of the island.

AGRICULTURE, INDUSTRY, AND COMMERCE.

The Province of Habana yields all the various products of the island, among which are to be enumerated valuable timber, such as mahogany, cedar, cherry, pomegranate, royal palm, pine, and walnut. There are several mineral springs in the town of Madruga, also baths in the town called "San Antonio de los Baños."

Some of its agricultural products are coffee—noted for its fine quality—sugar, tobacco, rice, corn, french beans, vegetables, fruit, and cereals. The principal products of the Isle of Pines are marble, which exists in large quantities and beautiful varieties, rock crystal, tortoise shells, pine, turpentine, cedar, mahogany, and other valuable woods. There are also deposits of silver, mercury, and iron.

This province has mines yielding quartz, gold, silver, copper, iron, coal (to a small extent), asphalt, and rock salt. There are quarries from which is obtained beautiful black and white marble; yet, notwithstanding this fact, the Cubans import for use considerable of the marble of Genoa.

There is abundant fishing and good hunting here. This province is the principal manufacturing center of the island.

There are numerous large factories for the manufacture of tobacco, cement, ropes, confectioneries, and jellies. Distributed through the province are foundries, tanneries, saw mills, and distilleries. The staple manufacture is tobacco. The immense industry of making cigars and cigarettes involves another industry, viz., box making; the sugar industry necessitates barrel making. The Royal Imperial Factory of La Honradez occupies a whole square and produces daily 2,532,000 cigarettes. Habana also builds carriages and ships, and manufactures iron and machinery.

The capital of this province, Habana, is the chief commercial city of the West Indies, and one of the principal commercial cities of America. This importance is not due solely to the richness of its productions, but in great part to the favorable position of the port of Habana at the entrance of the Gulf of Mexico, where much of the riches of the commercial nations of both worlds cross each other. It was said at a period when the commercial importance of Cuba was in its infancy, that Cuba was even then worth a kingdom to Spain. Its principal exports are sugar, tobacco, coffee, honey, confectionery and jellies, wax, building timber, fruits, etc.; the most important of these exports are sugar, tobacco, and cigars. Habana is the port from which almost all the principal products of the island are exported. Twenty-five per cent of the world's annual sugar production was furnished by Cuba in 1880; in 1894 29 per cent; in 1895 only 10 per cent. This sugar product is shipped mostly from the harbor of Habana. Some of the imports to this same harbor are lard, beef, flour, codfish, rice, wine, coal, olive oil, and coal oil.

GEOGRAPHY AND TOPOGRAPHY.

The territory of the province is divided into seven judicial districts. The province has an area of 2,265 square miles, the width between its extreme points north and south being about 40 miles, and the length between its extreme points east and west being 60 miles. It is situated in the northwestern part of the island. The largest and most important of its cities are the following:

Habana, population 200,448, the capital of the island and of the province of the same name, situated on the Bay of Habana, at its entrance on the northwestern part of the coast.

Bejucal, population 6,239, capital of judicial district of same name; situated in the west central part of the province.

Guanabacoa, population 28,043, capital of judicial district of same name, situated in the east central part of the province.

Güines, population 6,828, capital of judicial district of same name, situated in the east central part of the province.

Jaruco, population 2,165, capital of judicial district of the same name, situated in the northwestern part of the province.

Marianao, population 7,352, capital of judicial district of the same name, situated near the coast, 6 miles from Habana city.

San Antonio de los Baños, population 7,500, capital of the judicial district of the same name, situated in the west central part of the province.

For further description of these cities, see "Districts, Townships, Cities, and Towns of the Province of Habana."

LAKES.—There are three lakes in the southwestern part of the province, in the vicinity of the great swamp called the Ciénaga de Lapata, viz: Laguno (lake) Caimito, Guanamen, and Herrera; these have considerable size and differ from the general characteristics of the swamp lakes of the southern coast which are described as nothing but torrid quagmires, hidden away from everything but the burning sun, the tropical vegetation, and the loathsome alligators, and known only to the few Cubans who dwell in their vicinity.

Lake Ariguanabo is a remarkable lake in the central chain of high hills in the province; it is 20 miles southwest of Habana, nestles among the neighboring ridges, has a surface of about 6 square miles, and contains fish in large numbers, and is drained by the river San Antonio.

COVES AND INLETS.—There are a great many small coves and inlets on the northern coast of this province—Boca del Quibo, Caleta de la Lena, Caleta de las Cruces, and many others too numerous to mention.

CHANNELS OR STRAITS.—The Spanish name for these bodies of water is canal. The Rosario Channel connects the Gulf of Matamanó with the Caribbean Sea. The Channel de la Hacha separates the archipelagoes south of Habana in the Gulf of Matamanó, and the Channel of Ingles separates archipelagoes to the northeast of the Isle of Pines.

ARCHIPELAGOES.—The principal one is the archipelago de los Canarreos, in the Gulf of Matamanó. The *Islas del Man-gles*, northeast of the Isle of Pines, form part of this archipelago.

MOUNTAINS.—Commencing with the extreme northwestern part of the Province of Habana, there are but few elevations. Approaching Habana city, within a radius of about 6 miles, is the group of Habana, comprising the hills of Morro, San Carlos de la Cabaña, and San Diego to the east of the harbor of Habana. Santo Domingo de Etates, at the western arm of the bay, commands both the city and the neighborhood, and an elevation to the west called del Príncipe is the terminus of the great Paseo Militar. Near the city are the hills Jesús del Monte and el Cerro. Upon many of these elevations are built forts or castillos, bearing the names of the hills upon which they were erected. Going westward we find the Sierra (rocky range) de San Martín, Sierra Guanabacoa, and Sierra Sibarimar; still farther northwest is the Sierra Susana, which rises just west of the small bay Escondido. In the central part of the province there are situated the Sierra San Francisco de Janvier and the Sierra San Francisco. In the west central part is situated the Sierra de Bejucal. The orographical features of the interior of this province are not well defined. There are many *lomas* (small hills) scattered through the central region, and the elevations of the province gradually disappear as the southern coast is approached. Among these *lomas* are to be found the Tetras de Managua, Lomas de Mariel, Vijia Jaruco, Herrera, San Antonio, Loma de Robles, Serpentin, Bacuranao, and Camoa.

About 15 miles southeast of the city of Habana is found the cave of Cotilla, one of the remarkable subterranean cavities for which Cuba is noted. There are numerous lakes, which are more fully described under the geography of the province. In the southern part is raised the famous Habana tobacco, on plains, which are in the main low, interspersed with small rivers and their valleys. The valley of Güines owes its celebrity to artificial irrigation.

MARSHES.—There are the marshes of Majana and Liguaner, the latter being in the Isle of Pines.

The Isle of Pines, named by Columbus Evangelist Island, belongs to the judicial district of Bejucal, lies south of its province, and is separated from it by the Gulf of Matamanó.

Communication is kept up through the port of Batabanó, 60 miles distant. The Isle of Pines consists really of two islands, separated by a tidal swamp. Toward the eastern end of this swamp a few rocky ledges, flush with the water, have been utilized to construct a stone causeway between the two sections. These present a marked contrast; that on the north is wooded and mountainous, and its soil extremely fertile; while the southern section is low, rocky, and barren.

RIVERS.

Habana is well watered by a number of small rivers and streams, the principal rivers on the north being:

Río de Santa Ana, or Banta, Marianao and Chorrera, small streams which empty into the Gulf of Mexico to the west of the city of Habana. The Chorrera or Almendares supplies the city of Habana with water.

Cojimar River empties into the cove of the same name about 3 miles east of Morro Castle. This cove is clear of danger and the shores are steep-to. The water, except very close in shore, is too deep for vessels to anchor.

TELEGRAPH CABLE.—The end of one of the cables connecting Habana and Key West is landed here.

Bacurana, Tarara, Guanabo, Jaruco, Santa Cruz, Jibacoa, and Canasi are small streams emptying into the Gulf of Mexico east of Habana.

The rivers on the south are:

Guanabo, rising in the center of the province, flows south and empties into the Gulf of Matamanó. The Río Güines, the lower part of which is called Mayabeque, and the Río del Rosario flow into the Ensenada de la Broa.

Río Baracoa forms the boundary line between the province of Habana and Pinar del Río.

The Río Mayabeque and del Rosario flow south into the Ensenada de la Broa.

Among the streams that lose themselves is the Río San Antonio, which drains the wonderful Lake Auguanabo. It disappears beneath a large spreading ceiba tree, in San Antonio de los Baños. On the maps this stream appears to, but does not flow into the lake; it drains it simply and keeps its waters fresh.

COAST LINE.

The most important part of the coast line is that which lies around and about the Bay of Habana. This bay makes one of the finest harbors in the world, easy of access, spacious enough to contain 1,000 vessels, deep enough to allow them to come up to the wharves, and, except in the case of hurricanes, well protected on all sides. Within, the bay breaks up into three distinct arms, named respectively—Regla, Guanabacoa, and Atares. The coast of the Bay of Habana has several important hills, viz: The Punta to the west of the harbor entrance, Morro and Cabaña to the east, and Atares, which is situated at the head of the western arm of the bay. There are many plains or beaches, called playas, along both the northern and southern coasts of this province. The low land in the southern part especially is intersected with innumerable small rivers, flowing south and emptying into the gulf and bay.

ISLE OF PINES.—On the west and east coasts of the Isle of Pines are two large inlets, called in both instances the boca (mouth) of the tidal Ciénaga (swamp), which almost divides the Isle of Pines in two parts. The entire coast of this isle is indented with estuaries, points, small bays, and capes.

CAPES AND POINTS.

The coasts of this province, both north and south, have many points, but none large enough to be called a cape. On the north, commencing with the western part, we find:

Point Guanes, west of Habana City.

Point Cabeza de Vaca, west of Habana City.

Point Mangles, west of Habana City.

Point de los Roques, west of Habana City.

Point Fojonal, on the extreme of the projection forming the bay of Habana.

Point Talanquera, located on the northern coast east of Habana Bay.

Point Guayacanes, located on the northern coast east of Habana Bay.

Point Bacuranao, located on the northern coast east of Habana Bay.

Point del Cobre, located on the northern coast east of Habana Bay.

Point Guanabo, located on the northern coast east of Habana Bay.

Point Banza, located on the northern coast east of Habana Bay.

Point del Indes, located on the northern coast east of Habana Bay.

On the southern coast are to be found the following capes and points: Pajarar, Cajio, Vacia, Batijas, and Cayamas Points.

CAYAMAS POINT.—From Batabanó the coast runs westward for 15 miles to Cayamas Point; between are Cagio Point and River, where the vessels at Batabanó often obtain water. This river empties itself through the marshes, and the anchorage off it, with $2\frac{1}{2}$ to $2\frac{3}{4}$ fathoms water, is sheltered from all winds by the chain of cays in front of it. The marshy ground from the mouth of the river to the firm land is more extensive than that between Batabanó and Mayabeque, yet its environs are more cultivated.

CAPES AND POINTS OF THE ISLE OF PINES.

CAPES.—Cabo Frances, at the extreme northern point of the peninsula, which juts out, extending upward from the southern part of the island, forming the western boundary of the Bay of Sigüanea, and Cabo Pepe, at the extreme southwest shore of the island.

POINTS.—Point La Bibyagua is the point at the mouth of the river Sierra de Casas. This point and the Point Bujamey on the southern coast of the province proper form the connecting links for the line of communication between the province of Habana and the Isle of Pines.

Among other of the points is Las Barcas in the northwestern extremity of the island and points del Esté and Piedras on the southwestern coast.

REEFS, BANKS, CAYS, AND SHOALS.

The only banks, reefs, or cays of Habana Province worthy of mention are the following:

FLAMENCO AND CULEBRA CAYS.—About 5 miles southward of Calavera Cay, the western of the two forming Hacha Channel, lies Flamenco Cay, and a mile westward of the latter is Culebra Cay. Between the reefs extending in all directions from these two last cays is a passage with $1\frac{1}{2}$ fathoms

water. Between Flamenco Cay and those northeast of it there is a channel carrying $1\frac{1}{2}$ fathoms; but care should be taken to guard against the reefs which run 3 miles to the southward and westward nearly to the meridian of Flamenco Cay. Between Culebra Cay and the Petatillos banks there is another channel with $1\frac{1}{2}$ fathoms, and a group of small cays, the principal ones being:

Cruz, Redondo, Buena Vista, Malpais, Caravela, Sombrero, Bibian, Hermanos, Jaco, Aguila Horquita, Corua, and Carenero, separated from the main land by the channel of Cayamos.

There is a large bank off the northern coast, called Jaruco Bank.

SHOALS.—There are many large shoals in the Gulf of Matamanó; one south of the Cayamos Channel which separates this shoal from the main land, another south of the former shoal separated from it by the Hacha Channel, a shoal upon which are the banks called Los Petatillos, and a long shoal almost surrounding the north coast of the Isle of Pines upon which are the Islas de Mangles. This latter shoal is divided by the channel Ingles.

GULFS, BAYS, AND ANCHORAGES.

GULFS.—The entire southern shores of this province are washed by the waters of the Gulf of Matamanó, the western portion of which is called the Ensenada de la Broa.

BAYS.—For the Bay of Habana, see page 50.

BROA BAY.—From Gorda Point the shore takes a NNE. and NE. direction for a short distance, and then trends to the eastward for about 14 miles, when it bends round to the north and NW., forming the Bay of Broa, which, between Gorda and Mayabeque Points, northward of it, is 16 miles wide, and carries a depth of from 3 to 4 fathoms. The shores of this bay are submerged and covered with mangroves; at its head the Jatibonico River empties itself, and on the north shore several others run into the sea.

At 11 miles to the NW. of the Jatibonico River is the loading place of Caimito, which is much frequented. There are 13 feet water, mud, along $\frac{1}{2}$ mile south of the pier. At 8 miles westward of the pier is the loading place of Rosario, which has a tower and also a pier, and $\frac{1}{2}$ mile south of the latter

there are 11 feet water, mud. Both these anchorages afford shelter at all times except in the season of the SE. winds.

WATER.—At 4 miles WSW. of Rosario is Mayabeque Point; and $1\frac{1}{2}$ miles NW. of it is the mouth of the Mayabeque River, where there is always good water.

ANCHORAGES.—Going eastward on the north coast from its most western point are the following anchorages:

Cojimar, Bacuranao, Guanabo, and Santa Cruz. Batabanó and Guanimar are anchoring places on the southern coast.

RAILWAYS.

This province ranks second in mileage and importance of the railways on the island, having some 209 miles of tracks within its boundaries. The following are the principal lines:

1. From Habana to Pinar del Río, 113 miles, 39 of which are in the Province of Habana; single track, standard gauge, belonging to the Ferrocarril Occidente, an English syndicate, with headquarters in London.

2. From Habana to Guanajay, 35 miles, single track, standard gauge, belonging to the Ferrocarriles Unidos, a company largely controlled by English capital.

3. From Habana to Batabanó, 33 miles, single track, standard gauge, belonging to the Ferrocarriles Unidos.

4. From Habana to Matanzas and Bemba (Jovellanos), 90 miles, 46 of which are in Habana Province; single track, standard gauge, belonging to the Ferrocarriles Unidos; with branch from junction near Regla (Habana) to Guanabacoa, 2 miles.

5. From Habana to La Unión, 80 miles, single track, standard gauge, belonging to the Ferrocarriles Unidos, of which 68 miles are in Habana Province.

6. From Güines to Matanzas, 37 miles, single track, standard gauge, belonging to the Ferrocarriles Unidos; of which 26 miles are in Habana Province, with branch from Robles to Madruga, 5 miles.

7. From Habana to Marianao, 8 miles, and a branch from Habana to Amilo, on the coast, 3 miles; standard gauge, single track, suburban railway.

1. HABANA-PINAR DEL RÍO RAILWAY.

[Ferrocarril Occidente.]

TABLE OF DISTANCES.

HABANA.													
4	PINOS.												
6	2	A. NARANJO.											
9	5	3	CALABAZAR.										
10	6	4	1	R. BOYEROS.									
13	9	7	4	3	SANTIAGO.								
14	10	8	5	4	1	RINCÓN.							
20	16	14	11	10	7	6	SALUD.						
25	21	19	16	15	12	11	5	GABRIEL.					
29	25	23	20	19	16	15	9	4	GÜIRA.				
33	29	27	24	23	20	19	13	8	4	ALQUIZAR.			
38	34	32	29	28	25	24	18	13	9	5	DAGAME.		
39	35	33	30	29	26	25	19	14	10	6	1	Western Boundary of Habana Province.	
113	109	107	104	103	100	99	93	88	84	80	75	74	PINAR DEL RÍO.

[For Table of Distances from western boundary of Habana Province to Pinar del Río, see Province of Pinar del Río, "2. Habana-Pinar del Río Railway."]

ITINERARY OF WESTERN RAILROAD FROM HABANA WESTWARD.

Station (Arroyo Naranjo). Railroad here crosses the calzada which now lies on the right (west). Country to left rolling, wooded and brushy, with crops, and a stone wall now and again. Before reaching Calabazar is a deep valley and a long bridge, the largest of the line. Water tanks and side tracks here. Town chiefly on right. Beyond is a rolling brushy country, and beyond San Rafael a large bridge on stone abutments, then a short track running into a stone quarry. Then rolling cultivated country with cane, corn, palms, fine grass and horses, pineapples. Then a little station (Rancho Boyero) at which the calzada from Jesús del Monte to Rincón crosses to left, i. e., east. Beyond, the country grows more level, is cultivated, has hedges, cane, tobacco, bananas, and corn and pineapple fields. Telegraph follows track on the left. Large fields of bananas.

The station and town of Santiago, a good-sized place of probably 10,000 inhabitants, lying almost entirely on the east of the railroad. Town is flat, with small one-story houses, chiefly of stone. There are two side tracks here and a cattle chute, but no water tank. A large campo santo with quite high stone walls on right. Beyond, the country is flat and well cultivated. Stone walls quite common. To the left is a long low ridge with gentle slopes about one-half or three-

Distances from
Habana.
11 k.—6.87 m.

19 k.—11.87 m.
Santiago.

Distances from
Habana.

quarters of a mile away and parallel to the track in a general way, and commanding it. To the right the country is flat and cultivated. Dirt road with a few houses to the right and a line of railroad. Country here quite level except to left, where one or two hills lie as continuations of the ridge. There

22 k.—13.50 m. is a turntable at this place (Rincón). The country here is a little brushy and less cultivated than before. Plenty of palms and grass and a little water. Perhaps a kilometer beyond this a railroad track is crossed (Habana Railroad), which now lies on left. More corn. Flat country on both sides, with some cultivation and occasional stone walls. Between Rincón and Salud the railroad passes over country as above to a hill, runs over it through a rock cut a mile or more long and 4 or 5 feet above the car top, perhaps 20 feet high. Beyond are similar but shorter cuts. Then the road passes over a long but small embankment to the town of Salud, a place of considerable size, say 2,000 or 3,000 inhabitants, situated chiefly on the left (south) side of the road. There are a water tank, cattle chute, and two side tracks here. From Salud to Rincón the country is generally level and well cultivated. Troops could pass across the fields, though the latter would become heavy. At Rincón seem to begin, in the ridge mentioned, the hills that extend to Habana. Crops are largely cane. There is not much brush, and trees are found only singly or in groups.

31 k.—19 m. From Salud to Gabriel (a small place, flat, lying on both sides of the track, and numbering, say, 500 to 1,000 inhabitants), the railroad passes through a very highly cultivated country, level as a floor; crops chiefly cane, with bananas, grass, and stock. A few good stone fences, and seemingly good country roads of reddish dirt, now hard and smooth. There is at least one large sugar factory on the right. Little brush and trees, only singly or in groups. Small cultivated patches which may be guava. Troops could march anywhere over this country, and it is excellent for cavalry, with the exception of the difficulty of getting through the tall cane fields; in the wet season there might be trouble from mud.

44 k.—27.50 m. From Gabriel to Güira the character of the vicinity is the same. Great fields of cane, one sugar mill on left, patches of bananas around well-built stone houses. A country over which troops could well pass in dry weather, or in wet, though perhaps with some difficulty from the heavy soil. Very few fences or hedges, and a country as level as a floor. Güira is a small place, flat, with a population, say, of 500; houses largely of wood. At Güira is a railroad Y to the left.

52 k.—32 m. From Güira to Alquizar the country is perhaps less cultivated than before and is more brushy; trees, palms, more frequent, but country quite as flat; large sugar fields and one mill to left, to which narrow-gauge railroad goes from the main track of the Western Railroad. The country roads seem good, new, and hard, and sometimes, but not often, run beside

the railroad track. Frequently they are inclosed by stone fences. The railroad in general is inclosed by a kind of hedge and sometimes by a fence for a short distance, but the country in general has few fences or hedges, and is excellent for the march of troops. For description of Alquizar, see Road Itinerary.

Distances from
Habana.

The country from Alquizar to Cañas is still very flat and level, but cultivation grows less; sugar fields are still common; two sugar mills. One railroad track runs off to the left, probably 4 feet 8½ inch gauge, as it connects with this road. About half way across an outcrop of rock is very common, the land poor, apparently, and much overgrown by brush. The roads seem good, and troops could travel, but with more difficulty; probably could travel by the side of the railroad as well as anywhere. From Alquizar they could well march along the railroad. Stone fences are somewhat more common. The mountains begin to show themselves far to the front. Around Cañas is plenty of cultivation and stock; the town is small, population perhaps 500 to 1,000; houses of wood or stone, or both, covered with stucco, and tiled.

65 k.—41.50 m.

From Cañas to the next station, Artemisa, the run is short; the soil of the country seems better and more cultivated; there is much sugar. The country is flat and of the same general character. For description of Artemisa, see Road Itinerary.

70 k.—43.50 m.

From Artemisa to Mangas the road passes over a country still fairly level, but undulating now and again, and through several small cuts. Cane seems to end just before Artemisa is reached, and the country to become little cultivated, with comparatively few houses. There is much brush, with timber, but no forests. It would be more difficult to move troops here than before, but still possible. Along the sides of the track there would here and there be difficulties, though perhaps movements would be as easy there as elsewhere. There is no road along the track anywhere, except for short intervals. At Mangas—merely a collection of three or four huts—the mountains first appear on the right. From Artemisa to Las Mangas are good meadows, little corn or tobacco; a few stone fences.

78 k.—48.50 m.

From Las Mangas to Punta Brava the road is very rough, the country wild and uncultivated, with fine meadows here and there, but few fences; now and again a stone wall. The railroad, as a rule, is not fenced. The run is short, and the country passed over, such that troops could move better than before. From Punta Brava—a station house, and seemingly nothing more—the country is brushy, with good grass, little cultivation, and now and again a little corn and still a little cane, increasing as Candelaria is approached. There are few houses or huts in this part of the line; many open pine forests. The country is less favorable for troops; still they could travel

82 k.—53 m.

Distances from without great difficulty, except in the low spots frequently
Habana. overgrown with brush and jungle. There are plenty of mead-

92 k.—67 m. ows, more water than before, and cattle. At Candelaria the mountains are not more than 2 or 3 miles to the right. The country is a little rolling, and there have been a few dirt cuts on the road, not as high as the cars, and short.

101 k.—62.50 m. From Candelaria to San Cristóbal the country is flat, but brushy and wooded, practically impassable for troops near the railroad, but for no very great distance—2 or 3 miles, perhaps. There are few houses or huts; little or no cultivation. Large meadows near San Cristóbal, and a flat, open country, good for troops. At the town it is more hilly and cultivated; corn, tobacco, and bananas; few fences; huts more common.

101.6 k.—65 m. Beyond San Cristóbal, near the 104-kilometer post, the road passes through cuts reaching about to the top of the cars and nearly a mile long; the cut is through dirt, soft stone, and gravel. A little farther on it crosses a high trestle about 40 or 50 feet long and some 40 feet high. Crossing over the trestle the track passes over a small embankment. Between here and the 107-kilometer post it crosses two more small trestles and the pike running from San Cristóbal to Consolación.

Beyond here wire fences line the track or sometimes thin, low ledges. At about 108 kilometers the railroad reaches a wooden trestle some 75 feet long, passing over a little stream opposite Santa. From here the ground is rather low and brushy until the station of Taco-Taco is reached at about 111 kilometers. Just before reaching the station a wooden trestle is crossed, probably 150 feet in length. Beyond, the country is brushy, although the ground is cleared for 30 feet each side of the track, becoming more clear after the 113-kilometer post is passed. Near the 117-kilometer post a small wooden trestle is crossed. Farther on, the dirt road runs parallel with the tracks on the south side and near the 120-kilometer post a small wooden trestle is crossed.

Beyond, the country is level. There is little or no cultivation and few cattle. The road is very rough.

130 k.—81 m. At 126 kilometers the station of Palacios is entered. To the south of the station the country is brushy, and here are the usual stock pens and piles of firewood. Beyond the town, about a kilometer, is a small wooden trestle, and then comes a somewhat brushy country for a short distance.

138 k.—86 m. At 133 kilometers the road enters the station of Paso Real. Here a good road goes to the baths of San Diego located in the mountains. The town is very small, containing some 20 houses and huts, situated in a flat region. Just beyond is a short wooden trestle. The country here is largely given over to tobacco raising. Between 135 and 136 kilometers are

141.6 k.—88 m.

located a few huts. Farther on, between 138 and 139 kilometers, a wooden trestle is passed. The mountains to the north are only 5 or 6 miles away, while on the south is the dirt road running parallel with the railroad, although it can not be seen from the cars. Near the 143-kilometer post, a wooden trestle spanning a small stream of water is passed. The station of Herradura is entered at 145 kilometers. Here is a side track and a stone culvert. Beyond, the country is little cultivated and covered largely with palms. Some small cuts are passed at about 148 kilometers. A little farther on a water tank is passed and a wooden trestle crossed. At 150 kilometers a stone or brick bridge is crossed.

After passing through some cuts, the station of Consolación is entered—152 kilometers from Habana.

Shortly after leaving Consolación the railway crosses two small culverts and farther on a trestle spanning quite a stream. Just beyond the trestle it crosses the pike from Consolación to Pinar del Río.

At 160 kilometers a small trestle is crossed and the country becomes a little more rough. Passing some hills to the south, the road continues southwest across a small culvert and enters its terminus, Pinar del Río, 170 kilometers from Habana.

2. HABANA-GUANAJAY RAILWAY.

TABLE OF DISTANCES.

HABANA (VILLANUEVA).											
8	ALMENDARES.										
14	6	RINCÓN.									
17	9	3	GOVEA.								
21	13	7	4	SAN ANTONIO.							
26	18	12	9	5	SEBORUCAL.						
27	19	13	10	6	1	SALADRIGAS.					
30	22	16	13	9	4	3	CEIBA DE AGUA.				
33	25	19	16	12	7	6	3	Western Boundary of Habana Province.			
35	27	21	18	14	9	8	5	2	GUANAJAY.		

ITINERARY.

[For itinerary from Habana to Rincón see "3. Habana-Batabanó Railway."]

At Rincón the Guanajay branch (see Habana-Batabanó Railroad) does not cross the western track, but turning off to the right, i. e., north of that track, continues a *single track*, ballasted with dirt.

Somewhat rolling, brushy country, red soil, huts, and not much cultivation; country open and level.

Small bridge, level with track, 30 feet long on stone abutments; stone walls now on both sides of track; two lines of telegraph, one of two wires, the other of one.

Distances from Villa Nueva.
 27 k.—16.87 m. Low cut; short, 8 feet high; country open, level; *excellent for troops*.
 28 k.—17.5 m.

Country level; many *stone walls*; corn, tobacco; many palm trees; a fertile region; many cattle, and *stone walls* very common.

29 k.—18.12 m. Same; *excellent for troops*; reddish soil; country open and level; about 29 kilometers single *side track*; many horses and cattle here; three or four huts and station of *Govea*. Country roads here now good, but probably become bad in wet weather; no road along track, but country *excellent for march of troops*.

30 k.—18.75 m. Same; level, open country; cattle, palms, and bananas; corn, no cane.

33 k.—20.62 m. Same; country level and open; excellent for troops; no cuts of consequence thus far.

35 k.—21.87 m. A very low range of hills near railroad on north; then a *curve* and huts, indicating a large town; cross *small creek* by little *bridge 10 feet* long (no obstacles to fording), and arrive at *San Antonio*. Here are *two side tracks, water tank*, and a town of several hundred people; little *stone station house and platform*; country around somewhat brushy, but level in general; a small *stone warehouse* on track; houses of town largely of stone, surrounded often by bananas, tobacco, etc. No obstacle to be feared here; country fairly good for troops, though with stone walls and somewhat brushy.

38 k.—23.75 m. Country to left, open and somewhat rolling; to right, brushy and low hills; a small low cut.

39 k.—24.37 m. Hills on right lower, but brushy ridge continues on left; country somewhat rolling, but open, with many palms.

40 k.—25 m. Country fairly open and level on both sides.

41 k.—25.62 m. Level, but somewhat brushy; many palms; stone walls still common, but country always good for troops; considerable corn since leaving Rincón, but no cane, and the region seems chiefly cut into small fields for stock.

43 k.—26.87 m. *Seborucal*. *Stone station, stock chute, one side track*, half dozen huts; country level and open; no obstacle; considerable tobacco here.

44 k.—27.5 m. Country very level; many cattle and horses; considerable corn; country more open; *excellent for troops*.

45 k.—28.12 m. Large tobacco vegas and little temporary station house; country level and open; many cattle in small herds; stone walls now and again along track.

47 k.—29.37 m. Same; corn and bananas; country level and open; many stone walls; many cattle; excellent for troops; railroad very level throughout.

48 k.—30 m. Same; no cuts of importance thus far; country roads now fair; railroad single track; dirt ballast in general.

49 k.—30.72 m. Same; country level, fairly open; corn, bananas, huts here and there, palms, trees, tobacco, cattle; then a curve, two side tracks, and little *stone station house* of La Ceiba;

small *stone platform*; town of 40 or 50 houses at 50 kilometers. Country level; somewhat brushy; tobacco and bananas; no cane in this region; stone walls and corn here; palm trees; *water tank*. Distances from Villa Nueva.
50 k.—31.25 m.

Much tobacco; country fairly level and open, but shut in generally by palms and brush; plenty of corn here and huts; water probably comes from wells; excellent for troops thus far along railroad; crops do not interfere; chiefly tobacco and corn; huts frequent; soil reddish. 51 k.—33.13 m.

Same; country open and level; excellent for troops; much tobacco, considerable corn, many palms. 54 k.—33.50 m.

Country slightly more undulating and growing more open; stone fences fewer. 55 k.—34.1 m.

Country, especially to the left, pretty and open; many huts, cattle, bananas, tobacco, corn here and there; a slight *cut* on railroad; then *two side tracks* and *station of Guanajay*. Small *stone station*, *stock chute*, and *stone warehouse*. Fairly good place to land and ambush troops, though if the hills near the town be occupied by artillery, some difficulty might be anticipated. 56 k.—34.7 m.
57 k.—35.62 m.

3. HABANA-BATABANÓ RAILWAY.

TABLE OF DISTANCES.

HABANA (STATION VILLA NUEVA).

3	PUEBLO NUEVO.									
6	3	CIÉNAGA.								
8	5	2	ALMENDARES.							
11	8	5	3	FERRO.						
12	9	6	4	1	AGUADA.					
14	11	8	6	3	2	RINCÓN.				
18	15	12	10	7	6	4	BEJUCAL.			
24	21	18	16	13	12	10	6	QUIVICAN.		
26	23	20	18	15	14	12	8	2	SAN FELIPE.	
30	27	24	22	19	18	16	12	6	4	REDONDO.
31	28	25	23	20	19	17	13	7	5	1 QUINTANO.
33	30	27	25	22	21	19	15	9	7	3 2 BATABANÓ.
35	32	29	27	24	23	21	17	11	9	5 4 2 ALDEA.

HABANA (RAMAL) TO BATABANÓ.

Leaving the foot of the hill of *El Principe* (near the 4-kilometer post), the railroad runs in a straight line across the valley toward the range of hills lying along the banks of the *Almendares River* and surrounding *Puentes Grandes* and *Marianao*. The railroad intersects this range at *Ciénaga*, from which point a hill extends somewhat boldly into the valley eastward and toward the Western Railroad. The *guns of*

Príncipe sweep the line of this road as far as the *cut at Ciénaga*, about 3 kilometers from *El Príncipe*. From *Príncipe* to *Ciénaga* the country is open and low, a few low *cuts* along the railroad. Westward lies the range of hills mentioned; eastward the hill of the Catalan Club, called *Loma de los Jesuitas*, a low, rounded hill, completely *commanded by the fort of El Príncipe* and of much less elevation. Beyond and farther to the south lie the long line of trees and houses extending to the summit of the hill called *El Cerro*. This line marks the *calzada* to *Marianao* and *Guanajay*, which passing beyond the *Cerro* crosses the *Habana Railroad* at *La Ciénaga*. To this point also comes the *suburban railroad from Habana to Marianao*, which, running westward of *Tulipán* and of the *Calzada del Cerro* (i. e., between the *Loma de los Jesuitas* and *Tulipán*), continues to *Marianao* and the north coast at the inlet called *La Playa de Marianao*. A new line of *railroad from Regla to Matanzas*, intersecting the latter road about 2 kilometers from *Regla* station. This branch connects the southern and eastern lines of the *United Railroads of Habana*. It passes around the head of *Habana Bay*, running east of the *Calzada del Cerro*, and crossing the *Western Railroad* between *Cristina* station and a *cut* which shuts off the fire of the fortification called *Átares*. The intersection of this connecting link with the *Western Railroad* lies about 3 kilometers from *Cristina* station on the *Western road*. From *Ciénaga* the *Western Railroad* is concealed.

From *Ciénaga* a common road runs northward, which passes east of the *Baptist Cemetery* and along the hills which border the *Almendares*, but at some distance and concealed from that river. This road runs west of *El Príncipe* and cuts the *calzada*, which, passing by this fortification, continues to the cemetery; from the point of intersection the former road continues along the hill of *Príncipe* to the seacoast at *Vedado*. Though not good, it is practicable for wagons and is, in general, *covered from fire from El Príncipe as far as its intersection with the cemetery road*. The heights near *Ciénaga* are lower than the hill of *Príncipe* and well commanded by that work. The town of *Ciénaga* lies at the foot of the ridge mentioned; to the eastward is a low valley, which probably becomes a marsh in wet weather. The surrounding country east and north is open and cultivated with gardens. *This valley, as well as the Habana Railroad, passing through it, is well commanded by the fire from El Príncipe, and should a fieldwork be erected on the hill of Las Jesuitas probably the whole valley, the Habana and Marianao railroads, and the connecting line, as well as the calzada to Marianao and the Concha Station, would be thoroughly guarded. The Habana Railroad should be avoided as a line of advance to the city. The Western Railroad is screened from the fire of Príncipe. Both the Habana and Marianao railroads and the calzada*

enter one of the most strongly guarded parts of the city. *The ridge of hills lying along the Almendares River should not be followed*, for the calzada crossing them and leading from Marianao to El Cerro crosses the Almendares River and, as has been said, is exposed to fire beyond. *Little would be gained by the occupation of the hills along the river*, for though they seem to be as high or higher than El Príncipe, observation from the fort shows that this is not the case.

Ciénaga lies about 6 kilometers from Villanueva; from it the Key Hill can not be seen. The branch road connecting Habana Railroad at Ciénaga with road from Regla to Matanzas has "Y" at the former place. The suburban railroad to Marianao crosses the Habana Railroad within a few yards of the calzada to Marianao.

A double track extends from Ciénaga to Rincón, but from Ciénaga to Habana is a *single track*.

Passing south from Ciénaga, the country to the left is a low valley, well cultivated. The railroad occupies more nearly the center of the valley than before, the heights to the westward running off at a somewhat sharp angle. At 9 kilometers is a *large irrigation ditch*, the hills about 1 mile to the west. At 10 kilometers, to the west of the track, is the *open ditch which supplies one of the wards of the city with water*. About 12 kilometers the railroad reaches the *Vento aqueduct* on the left, and just beyond crosses the Almendares River by an *iron bridge some 60 feet long*. Almendares River now to the east of the track. Here a track runs to the westward toward the *sugar estate of Toledo*. Much cane. At this point the railroad has a *double track*. There are *two lines of telegraph*, one of four, the other of five wires; the road is well built, ballasted with stone, and in excellent condition. The cars are poor, in bad condition, made in Wilmington, Del. *Vento* is not a town, but *from it comes the water supply of Habana*. In the neighborhood are several *rock cuts*, extending along the railroad; they are short, and about the height of the car. The country grows less cultivated. From Vento it is said the calzada of Palatino follows the line of the new aqueduct to the point where the new reservoir is to be located (1892). This calzada reaches the Western Railroad at about 6 kilometers from Cristina, and thence for some distance lies parallel to the railroad; finally reaches the Calzada del Cerro near that suburb.

At 18 kilometers lies the little town of *Aguada del Cura*. Here is a small *wooden station and water tank*. There are no *side tracks*. The country about is somewhat flat, brushy. Cane and tobacco growing. Aguada is a small hamlet. Beyond, the country grows more level, more brushy, has little cultivation. Corn here and there. At 23 kilometers from Villanueva the railroad approaches the station of Rincón and passes within a hundred yards of the station of the Western

Railroad to the east. There is a *connecting track*, and on the left a switch joins the road. The Habana Railroad, at 24 kilometers from Villanueva, crosses the Western Railroad at Rincón.

From Rincón to the seaport of Batabanó the Habana Railroad is *single track*, well laid, kept in good condition, and well ballasted, frequently with stone. *Side tracks exist at Bejucal, Quivicán, San Felipe, Pozo Redondo, Quintana, and La Playa. Water tanks at La Playa, probably Pozo Redondo, and certainly at San Felipe.* The road in general passes through a flat and cultivated country. From the coast a ridge of hills is seen to the north, and thence the railroad gradually approaches, meeting it at Bejucal, and running parallel to it as far as Rincón. *After crossing the marshes extending from the coast to within half a mile of Quintana, wagons and troops could pass over the contiguous country to Rincón. From the seacoast at La Playa, wagons or perhaps carts drawn by single animals could be moved along the railroad embankment until the common road is reached at Quintana or Pozo Redondo; but this is unnecessary, as a good road—a turnpike, in fact—connects the port with the town, and a good dirt road runs thence to the railroad station.* From this point to Rincón there is no cut, no embankment, and no bridge (with the possible exception of that at Felipe) to cause danger or delay of consequence. Indeed, this is true of the entire line of Habana, with the exception of the bridge over the *Almendares River*; but this stream is so narrow that it could readily be crossed by a temporary structure, or probably forded without difficulty.

The Habana Railroad from Habana to Batabanó is one of the most important strategic lines of Cuba.

The present (March, 1890) station of the Habana Railroad is at Pueblo Nuevo, in the city of Habana. *Pueblo Nuevo is a temporary wooden station from which trains now leave on the old Habana Railroad because, it is said, the authorities will not permit trains to run farther into town, i. e., to the old station of Villanueva on the Campo Marte, about 2½ kilometers from Pueblo Nuevo. At Pueblo Nuevo there is a wooden platform, also a few little wooden offices. There are two tracks. The place is quite close to the sea, perhaps one-half mile distant, and from three-quarters to 1 mile from the station on the Vedado suburban road called Belascoain.*

Pueblo Nuevo is one of the poorer wards of the city, and is surrounded by hovels and shanties of wood, with better houses here and there of the usual stone and rubble. The railroad to Guanajay follows the main line to Rincón and then branches to the west. Some trains run through to Guanajay without change; on others a change is made at Rincón. The station is apt to be greatly crowded with venders of lottery tickets, cigars, papers, etc.

Double track extends to less than 3-kilometer post (i. e., only a few hundred yards from Pueblo Nuevo). On leaving the station, the road runs through a poorer quarter of the town, through the Quinta (former summer residence of the Captain General, but now occupied by the grounds and buildings of a kind of social club; it would probably become a *strong defensive position in event of an attack on Habana* by the Habana Railroad from Rincón), and under the hill of the fortification of El Príncipe, across the Paseo de Tacón, and at about 4 kilometers runs into the valley extending southward from Habana, and through which passes also the railroad to Marianao, and some distance to the east and concealed from sight is the Western Railroad (which crosses the Habana Railroad at Rincón). Between 4 and 5 kilometers the Habana Railroad passes some 200 yards west of the Hill of the Jesuits (Loma de los Jesuitas), not fortified, and about 5 kilometers a *ditch* running through the undulating, open, and cultivated valley. From the point of crossing the Paseo de Tacón (or of entrance to the valley) *the railroad is almost completely exposed to fire from the guns of El Príncipe as far as a ridge (cut on the railroad) which lies just north of the station of Ciénaga, 6 kilometers from Villanueva.* Thus far the country is open on both sides of the track; then there are a few low cuts; to the right extends the line of hills bordering the Almendares River and running toward Marianao. The railroad from the foot of the hill of El Príncipe to the ridge of Ciénaga—say 3,000 yards—is *exposed almost continuously to a raking, plunging fire.* The ridge mentioned protects, to some extent, Ciénaga from the fire of El Príncipe. At this cut, about 6 kilometers, the road curves and reaches the *station of Ciénaga, 6 kilometers from Villanueva.* This place is just within the suburbs of Habana, but the country around, and especially to the east, is generally open ground, covered with vegetable gardens. This region is probably swampy in summer (as the name implies: Ciénaga—swamp).

Ciénaga is an *important junction.* The Habana Railroad here crosses the railroad and calzada to Marianao, and a branch road is now (March, 1890) nearly completed, extending from Ciénaga around the head of the bay toward Regla, near which it taps the Bahía road, and crossing en route the Western Railroad. At Ciénaga are located *round houses* containing engines, and *railroad shops* of the Habana Railroad. There are *three tracks* here, and a *side track* to the Marianao Railroad.

At Ciénaga the railroad crosses the highway (calzada) to Marianao, then passes over the branch road to Regla at about 7 kilometers. Habana road here begins to have *two tracks.* At 7 kilometers the road reaches the other branch of the railroad to Regla, with a small *bridge 30 feet long* near by. To the left a somewhat low, broad, and level valley, cultivated

Distances from Villanueva.

3 k.—1.85 m.

4 k.—2.5 m.

6 k.—3.75 m.

7 k.—4.3 m.

- Distances from Villanueva.** generally with garden truck, extends to some low hills on the right, on which lies the little town of Puentes Grandes, less than a mile away.
- 8 k.—5. m. Between 8 and 9 kilometers, a *large ditch* crossed by the road by a *small bridge some 30 feet long*, not extending above the track.
- 9 k.—5.6 m. Valley rolling and open, with hills here and there; a little brush meeting ridge here about a mile away to the right.
- 10 k.—6.2 m. The stream lies on right of track; it is an *open ditch supplying one of the wards of Habana with water*; to the right, cultivation, corn, vegetables, etc.
- 11 k.—6.8 m. Low hills; mill to left, country less cultivated. A *calzada 50 yards to left*, and turrets of water main of Vento aqueduct. Several houses and constructions of waterworks near track. Then a *short cut*, perhaps 12 feet high, and a *little wood station* with large building Seminario on left.
- 12 k.—7.5 m. At about 12 kilometers the Almendares River, heretofore to west, is crossed by an *iron girder about 60 feet long*. Just beyond sugar railroad to right; a second branch of same beyond; *double track*, stone ballast; *two lines of telegraph*, one with four, the other with five wires. Country now rolling, much cane, cuts frequent but short, through rock and about the height of the car.
- 13 k.—8.1 m. At about 13 kilometers an *embankment, quite high*, say 20 feet. Country hilly; Western Railroad cut off from sight.
- 15 k.—9.4 m. *Rock cuts 20 or 30 feet high*; country broken, hilly and brushy; about 15 kilometers works, probably Vento waterworks, chiefly water supply of Havana, on the left.
- 16 k.—10 m. In *cut*; then to left *small pond*, and just beyond, stone buildings, probably lunatic asylum.
- 17 k.—10.1 m. Country less cultivated, more rolling and brushy; considerable settlement at asylum. Here a railroad to right, probably local; side track. Country now covered with *stone walls* and brush, and *not good for troops*, in fact it is not specially good on this line, considering the winding of the Almendares.
- 19 k.—11.9 m. *Station of Aguada del Cuba*. Steam engine and water tank here, stone station, very small town, wood platform, no side track, but double track of railroad. A little tobacco and cane; country somewhat brushy, but becoming more level. Country toward Western Railroad now brushy and somewhat rolling; huts, bananas, palms; less cultivation, but a little corn; horses.
- 20 k.—12.5 m. Same; *three lines of telegraph on left*, four wires; on right, one of three wires, one of two.
- 21 k.—13.1 m. Country now more brushy, cuts fewer, more trees, palms, hedges of cactus, few stone walls.
- 23 k.—14.3 m. A somewhat rolling, brushy country, red soil, huts and some cultivation, but not very much.
- 24 k.—15 m. *Station of Rincón*. A *switch* to Western Railroad here before reaching station. The Habana Railroad crosses the

Western Railroad at 24 kilometers from Villanueva (Habana Railroad), and at 1 kilometer from this point one track of the Habana Railroad turns westward, proceeding to Guanajay. Distances from Villanueva.

The *junction* is about one-half mile from the town of Rincón and hardly more from the *range of hills in rear, from which the junction could be swept by fire of musketry and field guns*. The region in front of the ridge is fairly level and open, though near the crossing of railroads the Habana road passes through a few low, short earth *cuts*.

At 25 kilometers the railroad to Guanajay branches westward from the Habana Railroad, and at this point there is a side track. Beyond this point of separation the Habana Railroad continues a *single-track* line to San Felipe and then branches into *two single-track lines*, one going to *Güines* and beyond, the other to *Batabanó*. The former of these branches continues a fine, well-graded road, ballasted in part with stone; the latter less good, but still a fair road to the south coast at Batabanó.

25 k.—15.6 m.

From the junction the Habana Railroad continues nearly parallel to the ridge of hills, along whose side runs the highway (*calzada*) from Habana to Bejucal, and some 500 to 800 yards from this ridge. It runs through a level and well cultivated country, and at 28 kilometers (3 kilometers from the junction mentioned) reaches the substantial town of *Bejucal*. From Bejucal to Rincón the *calzada* and railway run approximately parallel to each other, and at an average perhaps half a mile apart. The *calzada*, as a rule, lies above and commanding the railway.

28 k.—17.5 m.

The *station of Bejucal is good, new, and built of stone and iron*. There are *two side tracks and switches*. The railroad station is commanded by hills, perhaps half a mile to the north, and could be held with difficulty should the ridge be occupied by a hostile force.

At Bejucal the railroad crosses the highway running to San Felipe and Batabanó. The country now is cultivated with cane and corn, and at 31 kilometers is somewhat rolling, with stony fields separated by stone walls, and dotted with huts often surrounded by patches of bananas.

31 k.—19.4 m.

At 32 to 33 kilometers the railroad leaves the vicinity of the northern ridge of hills, and near the latter point again crosses the common road to Batabanó, which here approaches the little town of *Buenaventura*. The country grows more level, especially toward the south, and more open.

32 k.—20 m.

At 33 kilometers is a small *stone culvert*, and the country continues to grow more level and open, with fewer stones and better soil. Hedges now largely take the place of stone walls.

33 k.—20.6 m.

A *switch, side track, and small station*. The country now is fine, level, rich, with many cattle and much growing cane. Stone walls are still used, the railroad running between, with *small cuts* here and there; the range of hills 3 to 4 miles away on the north.

35 k.—21.9 m.

Distances from
Villanueva.

37 k.—23.1 m.

39 k.—24.4 m.

At about 37 kilometers the railroad again reaches the common road to San Felipe and Batabanó, and at 39 kilometers the *station of Quivican*, which consists of little more than a *station house of stone, and platform for loading sugar*. A sugar railroad reaches the main line here from the south, and there are *several side tracks* on the main line.

From Quivican, the common road to Batabanó follows the main line closely to *Pozo Redondo*. In the vicinity of Quivican there is much growing sugar cane.

Beyond 39 kilometers the railroad passes over a small stone bridge some 40 feet long, placed on stone abutments and one stone pier. The country is undulating and very fertile; much cane growing. To the south and close at hand lies the common road to San Felipe and Batabanó, which is crossed by the railroad at 40 kilometers, just before reaching which point it passes through a very low cut.

40 k.—25 m.

At 40 kilometers to the north lie brushy fields and meadows; to the south cane, and beyond the railroad crosses a little gully on a *small embankment*, then passes through a *cut about 10 feet deep*. Near 41 kilometers is another very *small cut*, the country having little brush, a few trees near the railroad, much cane, and a hut here and there. Both common road, now to the north, and railroad now run between stone walls through fine fields of cane growing from a reddish soil. From the point of last crossing of the common road the latter continues north of the railroad as far as San Felipe, when it crosses the eastern branch of the Habana Railroad (that to Alfonso Doce), and follows closely the southern branch as far as *Pozo Redondo*, or nearly to Batabanó.

43 k.—27 m.

From 41 kilometers to 43 kilometers (*San Felipe*) the railroad runs about east, through a fertile region in which much cane grows. The country is highly cultivated, chiefly with sugar cane; it is slightly rolling, with huts here and there. On both sides and including both railroad and highway—the latter a good, wide dirt road—are substantial stone walls. The range of hills which nearly intersect the railroad at Rincón is here perhaps 15 miles away to the north.

From Rincón to San Felipe the railroad is *single track*, generally well ballasted with stone, good repair, followed by a *telegraph line* of three wires; has *switches at Quivican and Bejucal*, is fairly level, and *with no bridges, cuts, or embankments of importance*. Both road and railroad—generally within easy supporting distance of each other—could be used as a line of advance, and troops could without great difficulty march over the country contiguous to road and railroad. Fire from the northern ridge of hills would become dangerous from about the vicinity of Bejucal to Rincón and for a short distance beyond that place toward Habana.

At San Felipe (about 43 kilometers) the railroad enters a

little wooden station. Here are *several side tracks, store-houses, and water tanks.* Immediately beyond the station house the railroad branches, the northern branch running nearly due east, to *Alfonso Doce*, the southern to Batabanó and La Playa de Batabanó (seaport). Distances from Villanueva.

Just east of the town of San Felipe, about 43-kilometer post, and a few yards beyond the junction of the branches of the railroad, there is a *curve* on the Batabanó branch; then the railroad *crosses a stream bed*, now nearly dry (January), on an *iron bridge some 40 feet long and 25 feet high*, resting on *stone abutments* and on *one stone pier*. South are cane fields and a dry stream bed, and close to the railroad the common road, which crosses the track at San Felipe, runs on the south—a good dirt road, uninclosed.

The country at 44 kilometers becomes slightly rolling; meadows and cane fields; few fences, no underbrush, and few trees; a few cattle; *excellent for the movement of troops and wagons in all directions*; about half a mile to the south a large sugar mill; beyond, cane fields continue, but are less numerous; the railroad, *a single track*, followed by *three lines of telegraph*, poles of wood. 44 k.—27.5 m.

Approaching 45 kilometers the railroad passes through a small *cut*. Beyond, the railroad crosses a large prairie, ground covered by coarse grass; no cultivation; no stock; country fairly flat; *wagon could travel anywhere*, and the common road close to the track on the west is, at this season, a good, hard prairie road. Far to the northeast are some huts and cane fields, but there is little cultivation. The railroad passes through a low *cut*. Far to the northward the ridge of hills is still visible. Small water hole. 45 k.—28.1 m.

The railroad crosses the common road to Batabanó, now on east. 46 k.—28.75 m.

Small embankment; a few huts on the east; a few horses; cane, grass, fences, and scattered palm trees; country open and slightly rolling. 47 k.—29.37 m.

From 47 to 48 kilometers there are huts on both sides of railroad and cane fields to east. The country is still flat and open, with meadows and cattle; cane and palms scattered here and there, singly and in groups; country along railway *suitable for the movement of troops and wagons*; common road rough, probably very bad in wet weather. There is here little brush or wood for repairs. Railroad runs nearly due south, track well ballasted, wooden sleepers; no cuts and few culverts; east of track a kind of hedge of cactus and brushwood overgrown with grass. 48 k.—30 m.

From 49 to 50 kilometers, continues over an open, flat country, covered with cane fields and meadows; a hut lies to the east, little underbrush here, and *country favorable for movement of troops*. Country begins to show less cultivation, is flat, and more brushwood appears on either side of the road. 50 k.—31.25 m.

- Distances from Villanueva.** Between 50 and 51 kilometers is the station of *Pozo Redondo*. Here there are several *side tracks*, a *water tank* and some *half dozen wooden houses*. A sugar railroad from the west reaches the main line, coming from the sugar mill of Santa Lucía. The country about Pozo Redondo is flat and very generally covered with brush. Here the common road to Batabanó leaves the railroad, going eastward through a lane and traversing a brushy region to Batabanó, about 3 miles away.
- At Pozo Redondo the Habana railroad is, of course, *single track*, and gauge 4 feet 8½ inches. The railroad is well laid, ballasted with stone.
- 53 k.—33.15 m. From 51 to 53 kilometers the railroad continues through a flat, brush-covered country, covered with stones and bowlders. It would be a *difficult country to pass troops and wagons over*, but still possible. There is little cultivation until the station of *Quintana* is reached, at 54 kilometers. This is the station of the town of *Batabanó*, which lies about 1½ miles to the east, and is connected by a good dirt road.
- At *Quintana* is a *side track*, and much cane is shipped from mills to the west. About *Quintana*, growing cane; but a short distance beyond thick underbrush again appears and the country is uncultivated and the *ground grows low, marshy, and impassable*, except on the railroad embankment.
- 55 k.—34.37 m. The marsh begins to become impassable at perhaps 55 kilometers even in the dry season, and the country continues low and swampy to *La Playa de Batabanó*, at 58 kilometers from Villanueva, Habana. During the last 2 or 3 kilometers the railroad lies between large ditches, frequently filled with water. The country, like all the south coast of the west of the Island of Cuba, is generally low and swampy. On the outskirts of the settlement of *La Playa* the railroad approaches the common road, a fine turnpike, going to the town of *Batabanó* proper.

4. HABANA, MATANZAS, AND JOVELLANOS RAILWAY.

TABLE OF DISTANCES.

REGLA (HABANA).

10									MINAS.
13	3								CAMPO FLORIDA.
19	9	6							SAN MIGUEL.
24	14	11	5						JARUCO.
30	20	17	11	6					BAINOA.
38	28	25	19	14	8				AGUACATE.
42	32	29	23	18	12	4			EMPALME.
44	34	31	25	20	14	6	2		BOUNDARY OF PROVINCE, WEST.
56	46	43	37	32	26	18	14	12	MATANZAS
70	60	57	51	46	40	32	28	26	LIMONAR
90	80	77	71	66	60	52	48	46	BEMBA (JOVELLANOS)

MATANZAS PROV.

DESCRIPTION OF ROAD.

Between Jaruco and San Miguel there are many deep and heavy rock cuts. Here the road could be easily destroyed. The grade is very steep between these two stations. The cuts are deepest and largest from about 31 or 32 kilometers from Habana, and some of the curves are located in cuts or at their beginning. The town of Jaruco commands the railroad and occupies what seems to be a divide. The place is important. Troops in an advance from either direction might have difficulty at Jaruco. From San Miguel to Habana, or at least part of the way, the grade is downhill. The bridge over the stream at Campo Florido would cause difficulty. It is a short but high bridge, probably more than 50 feet long. This stream must be bridged in order to cross troops, for the banks are high, steep, and wooded. It is probably the largest bridge on the line, or, if not the largest, at least the highest and most difficult to replace. In the vicinity of Campo Florido the country is rolling, but sufficiently good for troops. In fact, from Habana to Jaruco troops, even cavalry, could march near the track, but there would be difficulty for guns and wagons. The railroad could be easily held or destroyed. As far as Matanzas, troops could march across country near the railroad, but obstacles—chiefly hills and brush—would be met. In some places country roads of dirt, good in dry weather, follow the track, but soon diverge, and there is no thoroughfare between the two places. As usual in Cuba, however, local roads might probably be taken from point to point, but they would probably lie at times far from the railroad; in general no road is found along track. The obstacles to an advance should be looked for near Empalme and at Jaruco and in the cuts beyond that place toward Habana. From the general character of the country many good defensive points exist and many points of ambush. The railroad would be difficult to capture and hold, especially near Jaruco.

From Matanzas to Bemba (Jovellanos) the road runs through an undulating country and has many cuts, but of no great size. The railroad could be well defended, but not disabled for a great length of time. There are a few embankments and bridges, none of whose destruction would be very serious. This continues for some 30 kilometers to about the town of Coliseo; east of that the road in general is level; there are a few low cuts, but nothing of importance. Troops could march without difficulty from Bemba to Matanzas, and the road, if captured, could be readily held.

The Bay road between Matanzas and Bemba (Jovellanos) is very rough; cuts and rolling country begin about 134 kilometers; light cuts at first, then country grows more rolling, but in general is open and favorable for the march of troops. Extensive meadows and some cattle, but not a great many as

compared with the country between Sagua and Concha. This continues to Tosca, where there is a short curve; open rolling prairies, many cattle, and some cane; somewhat sharp grades from 134 kilometers. At 126 kilometers steep sharp grades, but cuts thus far light. Country rolling and open; some cane, but chiefly meadows. The station of Coliseo lies within about half a mile of a line of hills, wooded in part, in part open; these command station and railroad from the east—i. e., approaching from Bemba. A fairly good stand might be made here, perhaps stronger than any position seen to the east. These hills are rocky and brushy where the railroad passes between; they also command the approaches from the west; they are low, brushy, and rounded.

Beyond Coliseo to the west the country grows more hilly; a road to the left; in the distance is a high ridge; hills also lie in the distance to the right. This hilly country continues along the line of the railroad as far as Habana. Beyond Coliseo and before reaching Limonar there are many points where the road could be strongly defended. The grades here are sharp but not steep, and cuts are not large, but beyond Caobas cuts grow larger, probably 30 feet deep, and are mostly through rock; curves are frequent and grades sharp; country hilly and often brushy.

In the vicinity of 103 kilometers the ground is stony.

ITINERARY OF RAILROAD FROM HABANA (REGLA) TO JOVELLANOS.

The station at Regla is a good structure of iron and stone; near by large warehouses of iron and stone. Ferry boats, capacity, 12 to 15 vehicles; boat enters slip of ordinary kind. Ferry connecting with dummy road to Guanabacoa, near northern part of Regla; other ferry near southern part.

Leaving Regla the train runs first along the eastern inner arm of the bay at Habana, which lies on the right of the track and, on an average, some 200 yards distant, the intervening ground being low and marshy. Entering Regla by this road, the track (and train) is *exposed to fire from Atares*, and perhaps the distant fire from El Príncipe; but the guns of Cabañas, Morro, or No. 4, could not here reach the track, which is sheltered by hills in that direction. The track on the land side is walled by a cut in the rock, some 20 feet high, of the soft limestone rock of this region. On leaving Regla there are *four tracks—one to Matanzas, one to Guanabacoa, and the others merely long sidings*. Gradually leaving the vicinity of the bay, the road passes along an *embankment some 15 feet high* and reaches its junction with the new connecting line which passes from the Habana Railroad at Ciénaga, crosses the Marianao road, the western (at about 3 kilometers), and around the bay to the Bay road, which it reaches a mile (more or less) from Regla.

Beyond the junction, the Matanzas Road passes through a short cut with walls probably 20 feet high, crosses the high road (calzada) from Jesús del Monte and Luyano to Guanabacoa, and shortly beyond reaches the 3-kilometer post, near which there are small cuts. Thus far from Regla the country along the railroads has not been favorable for the movement of troops, being low around the head of this branch of the bay, and rolling and hilly northward. Crossing the calzada, however, the country becomes open, rolling, and covered with grass, with occasional groves of palms, and most favorable, especially toward the south, for the march of troops, though hilly. The country between Guanabacoa and the hill of Jesús del Monte is of this character. Northward the country is hilly and open. The railroad here passes through cuts, but they are low and short.

Distances from
Regla.

3 k.—1.9 m.

A dirt road runs off to the right, i. e., southward, and another beyond. The track here is good; well ballasted with stone. The train runs rapidly.

5 k.—3.15 m.

The country continues rolling; the trees, chiefly palms, become more common; one small culvert over stream at about 6 kilometers, a second about 7 kilometers, and then another about 8 kilometers, all small and of stone.

7 k.—4.4 m.

There is a cut here some 200 yards long, of rock; the sides reach above the tops of the cars. The country in general is open, covered chiefly with grass, though a little corn is seen. It is hilly and pleasant, with cattle and huts, and plenty of water even now in the dry season flowing through rivulets.

9 k.—5.6 m.

Near here an iron bridge, some 50 feet long, over a little stream, and beyond some short rock cut some 20 or 30 feet in height. The country continues rolling and open, a seemingly good grazing country with many cattle, but few crops. Palm trees singly and in groups. There are few fences and not many huts.

12 k.—7.5 m.

At 15 kilometers the station of Minas, with three side tracks; near here the road runs through small cuts and over small embankments.

15 k.—9.5 m.

Country continues of the same general character, perhaps more rolling. Favorable for the march of troops in vicinity of railroad. At about 16½ kilometers there is a small culvert 20 feet long, and near by are alternations of short cuts and low embankments. Not many huts or houses.

16 k.—10 m.

More cultivation—cane and corn chiefly—small hedges, few or no fences; no stone walls. Telegraph line here runs on the left; wooden poles, porcelain insulators, and four wires.

18 k.—11.3 m.

Many huts surrounded by yucca, corn, cane, and cattle. Here the road continues through cuts, the country growing at 22 kilometers more brushy and very hilly, but still producing corn and cane; horses grazing along the road.

20 k.—12.5 m.

Station called Campo Florido; side track, some half dozen houses, wooden station house, water tank, stock chute. Some

22 k.—13.75 m.

Distances from 100 yards beyond is *iron bridge 50 feet long* over stream.
Regla. Road good and well kept up.

24 k.—15 m. A *side track, wooden station*; much cane growing near by; large ingenio half mile to left, i. e., north of track. About 24½ kilometers there is a small *culvert*; open country, covered with sugar cane, rolling, with wooded hills some 2 or 3 miles away to the right.

25 k.—15.6 m. Country becomes very *hilly*, but not rocky; much cane; country near railroad excellent for march of troops. Many cattle and huts; latter usually surrounded by patches of yucca, bananas, vegetables, grass, cane, and corn. Many small rivulets.

27 k.—17 m. Here is an easy curve; many cuts; grades easy.

28 k.—17.5 m. Much cane; no wagon road along track. The 28-kilometer post is in a *cut some 200 yards long and 20 feet high, through rock*. Just beyond this there is the *station of San Miguel*. Here are *two side tracks*, a small *stone station house*, and a large sugar mill some 500 yards to the left. This would be a *good place to land troops*, as in fact are all the stations. Much cane here; no brush near station. There is a warehouse and two or three houses and huts; much cane. Beyond the station there is a *long causeway* and a *stone culvert*, then the 30-kilometer post and a cut, with huts, bananas, corn, and cane over the surface of the country. At 30½ kilometers a little *bridge with stone abutments*, probably 20 feet long. The country continues open and rolling, with palms and much cultivation.

31 k.—19.5 m. Country is of the same character, with huts here and there, palms, much cultivation, the railroad passing through *frequent cuts*. There is here one line of *telegraph* with four wires.

33 k.—20 m. Similar conditions. At 33 kilometers there is a *side track*, and beyond it a little brushy ravine and several *rocky cuts*, then a *small causeway*. Much corn. The region now becomes more *rough* and *hilly*, the hills often stony, and the railroad passing through *many deep cuts*.

35 k.—21.9 m. Wooded hills to the left; country grows wilder, but there are still plenty of huts and cultivation. The railroad could *easily be destroyed here*.

36 k.—22.5 m. A hut; here the railroad could *easily be defended*; beyond, it passes through a *cut in white rock*. To the left lies a little village in the hollow, the country being very hilly and somewhat rugged.

37 k.—23.2 m. A *deep rock cut*, and on the left the outskirts of the town of Jaruco, which is perched on the hills above.

38 k.—23.8 m. Railroad passes through *long deep rock cuts*, where the railroad could easily be *defended* or *destroyed*, and reaches the station of Jaruco, distant perhaps a mile by the road (calzada) from the town proper. Approaching Jaruco the railroad has steep grade. *Wooden station house* and *water tank*, water being apparently pumped by horsepower. Three

side tracks; ground about station favorable for the landing of troops, generally level and open; small banana grove near by and cornfields. Just beyond Jaruco, 39 kilometers, the country grows more level; cane; stone walls along railroad track.

Distances from Regla.

39 k.—24.4 m.

Two small *culverts*; country flat and open; excellent for passage of troops; no cuts since leaving Jaruco.

41 k.—25.6 m.

A *station* and *side track*; sugar road to ingenio about 1 mile to the right.

42 k.—26.3 m.

44 k.—27.5 m.

Flat open country; many meadows with cattle and horses, little cultivation; more brush in the distance to right and left. Country roads seem good, hard dirt.

Station of Bainoa. Three *side tracks*, another old track to the right. Town probably has 300 people; lies in flat country. *Wooden station house, water tank and platform, small warehouse.* Many oranges loaded here. Soil of red dirt, producing bananas and cane; country flat, more brush, but clear along railroad. The latter continues a *single track* between cactus and brush hedges. On left of track *telegraph* line of poles with four wires.

45 k.—28.1 m.

A few houses, a *short side track* to the right and a little *culvert*. Roadbed ballasted with stone.

50 k.—31.3 m.

From 51 to 52 kilometers there is much brush and little cultivation; at about 52½ kilometers there is a *side track* and *switch* to the right, and at 53 kilometers a little *station house* and fields of cane. Troops could move through the short stretches of brush found.

52 k.—32.5 m.

A few huts, much cane, country level, hill in the distance on the left (i. e., toward the sea).

54 k.—33.8 m.

At 55.5 kilometers there is a *side track to the right*, a few huts, cane. At 56 kilometers cane on both sides, vast fields, level. Between 56 and 57 kilometers a small curve, and at 57 kilometers a small sugar railroad comes in at the right, near *Aguacate*. *Station of Aguacate, three side tracks, water tank* (horsepower); probably 1,000 inhabitants; houses of wood or stone, tiled; country flat, hills 2 or 3 miles to the left; large sugar mill 1 mile to left. There is very much cane here. Beyond is a *sharp grade* and at 59 kilometers many palms; country near railroad flat. Palms, great fields of cane, and meadows, no brush.

56 k.—35 m.

57 k.—35.6 m.

59 k.—37 m.

Hills again, country becoming brushy and uncultivated; railroad passing through *rock cuts*, not deep. From 60 to 61 kilometers there are *rock cuts* and a curve, and at 61 kilometers the country becomes rocky to the left, open to the right, and level and good for troops near railroad.

60 k.—37.5 m.

61 k.—38.1 m.

Strong defensive position against an advance from the direction of Matanzas. Hills command road eastward for a long distance as far as *Empalme* and perhaps beyond, where the branch road to *Madruga* enters from the left at an angle of perhaps 15 degrees with the Bay road. In this angle lie the

Distances from Regla. hills mentioned commanding both roads; hills are brushy and rocky, but not covered with large trees. They are not high; would serve well for field guns, and are about 2 kilometers from Empalme station. Empalme is nothing but a junction. *Stone station house* and a few huts. To the left, toward the coast, brush and brushy hills some 1,000 yards away. To the right are palm-dotted meadows, through which the branch road approaches the Bay line. At Empalme are *stone platforms*, and beyond this to Matanzas are two tracks on one roadbed. Formerly there were separate roads, but now they have the effect of a double track from *Matanzas to Empalme*. The road coming in at *Empalme* runs to *Madruga* and *Güines*. From *Empalme to Matanzas* two lines of *telegraph* accompany the railroad track.

64 k.—40 m. Beyond *Empalme*, about 64 kilometers, are *low rock cuts* and a curve. Double track continues to Matanzas; ballasted with stone, and the 108-kilometer post corresponds to about 64½ kilometers on the Bay road. About 64 are some very small *stone culverts*. Country brushy; little cultivation.

Heavy cut through rock some 40 feet high and 300 yards long, with a curve in the track before and after, but the cut itself is straight.

67 k.—41.9 m. The country is rolling, with brushy hills to the right; about 67½ there is a small *culvert*, then a rock cut; to the right a brushy hill; to the left open ground; tall, single, irregular cone to the left front (probably the *Pan of Matanzas*). Troops could move readily here, but immediately along tracks are many rock cuts.

70 k.—43.8 m. The station of *Ceiba Mocha*. *Two side tracks, water tank*. *Wooden station*, a few houses, wooded hills to the right, low, open ground on the left. Between 70 and 71 kilometers is a small *culvert*, and at 71 a *side track and station house*, probably belonging to the old Habana Railroad. Here there are many *cuts* through rock; country rolling and brushy, but troops could move over it.

74 k.—46.3 m. Country becomes more open and there is more cultivation, but less water between Jaruco and Matanzas than before reaching Jaruco, but there is enough. Some yards beyond 74 kilometers a *culvert* above a small sugar road, and beyond is the town of *Benavides*, where there is a *side track*, and seemingly a branch sugar road to the left. Town has perhaps 100 people. *Rock cut* here at about 75 kilometers; then the road runs down a *steep grade*. Country open and rolling, cultivated with corn; huts here and there; meadows. *Pan of Matanzas (?)* to the left.

76 k.—47.5 m. Country continues favorable for troops, which thus far could move along the road or near it from as far back as Jaruco. About 77½ kilometers a small *bridge, some 20 feet long*, over a little stream. Railroad level, passing through *rock cuts*; country open, with huts here and there. Country

continues open to 79 kilometers. A few fences, huts, corn-fields, and meadows; hills about 1 mile to left.

The same open, rolling country to the right; a *telegraph* line with two wires.

Houses near the track; country rolling and cultivated.

Bridge some 50 feet long over a small river; country well settled.

Roads and houses; country open and rolling; brushy ridges lie to right; to left is cultivated valley and many houses.

Conditions the same. *Railroads from La Union and Jovelanos join here.* To the right are wooded, brushy heights.

Scattered houses of outskirts of a town seen to the left, *Matanzas*. Railroads skirt town, leaving it on the left, and enters *station*, a good structure of stone and iron. *Many side tracks.*

Railroad leaves Matanzas 88 kilometers from Regla, ascends hill in rear of town, and, curving around head of Matanzas Bay, intersects another road. Thence there is a *double track*. Just before 89 kilometers a small *culvert*. Double track to the left within 100 or 200 yards of bay; to the right cut in side of mountain; brushy hills.

Railroad runs in rear of Playa (beach) 100 yards from shore; to the right brushy, uncultivated hills; to the left sharp descent to bay, 200 yards distant.

Road continues around bay; *double track*, stone ballast; *three lines of telegraph*, single wire each.

Country more free from brush; to right a stone wall; to left, bay 500 or 600 yards distant. Extreme northwest point of Matanzas bay visible.

Leave bay on left. *Station of Gelpi*; two tracks, *three sidings*; small wooden station; two or three houses.

Small bridge 20 feet long.

Country now level, fertile near track; cane; stone walls along railroad; cattle, huts, some brush; country fairly level and cultivated in the distance; good for march of troops; stone walls here and there. Near here Matanzas Railroad diverges to the right (south).

Guanabana; *side track*; cane, cattle; country fairly level; small town of half a dozen houses and huts (tiled and cane); *double track* and *one or two sidings* here; country low; isolated hills here and there; ground sterile and stony.

Two very small *culverts* over low places; open rolling country; a little cane, grass, few fences; few or no cuts of consequence; stone ballast; one line of telegraph (2 wires).

Very small dirt *cut* and *curve*; open ground on either side, rolling and cultivated; cane, sugar mill to the right, huts. Fine region; *excellent for march of troops*.

One *switch*, and little *station of Ibarra*; stone houses; small *culvert* 6 feet long about 600 yards beyond. At 102 kilometers fine open rolling country, grassy and cultivated.

Distances from Regla.

79 k.—49.4 m.

80 k.—50 m.

82 k.—51.3 m.

83 k.—51.9 m.

84 k.—52.5 m.

85 k.—53.1 m.

87 k.—54.4 m.

88 k.—55 m.

90 k.—56.3 m.

91 k.—57 m.

92 k.—57.5 m.

93 k.—58.1 m.

95 k.—59.4 m.

96 k.—60 m.

98 k.—61.5 m.

99 k.—62 m.

100 k.—62.5 m.

101 k.—63.1 m.

- Distances from Regla. Small *embankment* and little *culvert*, then small cut 20 feet high and 50 yards long.
- 102½ k.—64 m. Small bridge 40 feet long. Country less cultivated; rolling, very stony, stone walls.
- 103 k.—64.4 m.
- 104 k.—65 m. Rock cut and curve; *embankment* and bridge 50 feet long, cut 20 feet high, 100 yards long; then small cut 20 feet high. Near 105 kilometers a bridge on stone piers 150 feet long, 30 or 40 feet high; then cut 100 yards long, 20 feet high.
- 106 k.—66.3 m. Small bridge 40 feet long, then a small cut with hill on the right.
- 107 k.—66.9 m. Kilometer post is in a short cut 30 feet high, then curve; the station switch and *embankment*, with bridge 75 feet long on stone piers.
- 108 k.—67.5 m. Short rock cuts 20 feet high, then two side tracks and station of Caobas. Old stone station, water tank, 3 or 4 side tracks, loading platform, and half dozen houses. Country open, rolling, less cultivated; good for march of troops. No road near railroad; stone fences, palms, grass.
- 110 k.—68.7 m. Country somewhat hilly; open except on hills, there brushy; cane chief crop.
- 111 k.—69.5 m. Near 111 kilometers is a very small cut; sugar road, single track, not ballasted with stone; then Limonar, 3 side tracks, old station and platform. Town of several hundred inhabitants. On left a sugar railroad comes in from right; country open, rolling.
- 114 k.—71.2 m. Same characteristics. Road level; wooded hills to right and left.
- 116 k.—72.5 m. Cane to left; barren, wooded, and rocky hills to right and left; much stone; stony fields.
- 117 k.—73.1 m. Stone walls; road ballasted with stone; slight down grade; small bridge 20 feet long.
- 118 k.—73.7 m. Side track and station of Sumidero; single track. Road here has a middle rail for some purpose. At station two or three side tracks, half dozen houses and huts; station of stone; sugar point. Beyond station open country; hills on either side in distance; low cuts here and there, short and unimportant.
- 120 k.—75 m. One short siding; cane and grass country; open and suitable for march of troops; cuts and grades slight; road very rough; stone ballast; single track; stone walls on both sides.
- 123 k.—76.9 m. Less cane, more grass; then brushy ridge (no cut) and town of Coliseo. A strong stand could be made here on hills just before entering station; these are low and command track, but there are many such places on road.
- 124 k.—77.5 m. At Coliseo (124 kilometers) five or six side tracks; water tank; sugar road comes in from Ingenio on left; a dozen houses, stone fences, also huts; small culvert just beyond.
- 125 k.—78.1 m. Small side track, no station; country along railroad level; much cane.
- 126 k.—78.7 m. Country open and good for march of troops; few grades; small curves now and then.

- Rich region; *wire fences* with cane posts; then *side tracks*. Distances from
Station of Tosca; several *side tracks*; level country; five or Regia.
 six houses; on left road to sugar mill; open country; *fine for* 128 k.—80 m.
march of troops; beyond a little *bridge 30 feet long*.
- Country level, much cane; bushy and wooded hills in distance; roadbed good, of stone. 130 k.—81.2 m.
- Country level, much cane, sugar mills, and houses; well 132 k.—82.5 m.
 inhabited; just beyond 132 kilometers two small *bridges* or
culverts.
- Hut and *side track*; wide meadows, level, resembling in 133 k.—83.1 m.
 appearance a lake bottom; wooded hills in distance; few *cuts*
 or curves.
- Same; *side track* and hut; cane and meadows; fine region. 134 k.—83.7 m.
- Short *side track* and *sugar railroad* to left. There are 135 k.—84.4 m.
 many such along route. *Country superb for troops*; a few
 streams of slight importance; few crops except cane.
- Madan station*; *side track*, *water tank*, five or six houses, 137 k.—85.6 m.
 and *warehouses*; *sugar road* to right; country the same.
- Great meadows; cane fields and sugar mills; country level, 139 k.—86.9 m.
 open; a few palms and ceiba trees; rich, fertile region. A little
 beyond *sugar railroad* comes in from left. Railroad here as
 level as a floor.
- Water here from wells*; road ballasted with dirt; single 140 k.—87.5 m.
 track.
- Bemba (Jovellanos)*, junction of *Cardenas and Jucaro Rail-* 141 k.—88.2 m.
road; many *side tracks*.

ITINERARY.

Leaving La Unión, 80 miles—129 k.—from Habana, where it makes connections for Matanzas, Cardenas, Santa Clara, Murga, and other points, this line runs west over a level country little cultivated, crossing three small culverts and enters the station of Bermega 114 kilometers.

Distances from Habana.

122 k.—76 m.

Beyond here it crosses a level, fertile country, passing over one small trestle shortly after leaving the village above mentioned. On the north are a range of hills. The railroad, after passing these, enters Los Palos, where a pike runs to Nueva Paz. Beyond the road lies a level, fertile country, little cultivated, crossing over 5 small culverts and entering the village of San Nicolas, 83 kilometers. Here the railway turns a few points north, traversing a country more broken and undulating. Many small culverts are crossed. Some 4 miles from Güines it crosses quite a trestle, and passing over a level country, enters Güines.

104.6 k.—65 m.

87 k.—54 m.

76 k.—47 m.

Single-track road. Two lines of telegraph, one with three wires, the other five. Road smooth and ballasted with stone. About 1 kilometer from Güines there are a *side track* and *branch road* to the left. First post, 69 kilometers. Road very level; country flat; cane, meadows; trees and brush here and there.

69 k.—42.78 m.

Side track, station without name (probably La Casaberia); *side track* (probably sugar road) to left; one house, herds of cattle, station house of stone; cane.

67 k.—41.54 m.

Railroad runs between *stone walls*, then *little wooden station house* and *side track* for cane (probably Palenque).

65 k.—40.30 m.

Cane, meadows, a few cattle; country slightly undulating, but few cuts, curves, or culverts.

64 k.—39.68 m.

A *railroad follows main road on right*, probably sugar road.

61 k.—37.82 m.

Fine railroad between *stone walls*; then *station of Melena*.

60 k.—37.2 m.

Three side tracks, loading platform, cane field on either side; *wooden station, water tank, small coal supply*; large sugar mill to right, little track to it.

A fine road through a fine country, much cane, scattered palms, huts; excellent for troops. Country roads good in dry, probably bad in wet weather; red soil. Country open and level, with few cuts or curves.

59 k.—36.58 m.

Same; cane, cattle, huts, a little brush and trees; few or no cuts.

56 k.—34.72 m.

Level country; cane, huts, and meadows; then *three side tracks and station* of no name (probably Guara); stock chute, cane; hills still on right, nothing to left. *Wooden station, old platform, dozen huts*, level, open country, *stone walls*, hedges, cattle, cane, and huts; fine region; best road in Cuba.

54 k.—33.48 m.

Cane; huts; level country; very small *cuts*; road straight; stone-ballasted; a few small *culverts*.

52 k.—32.24 m.

Cane and meadows; *country excellent for troops*.

51 k.—31.62 m.

BRANCH ROAD FROM ROBLES TO MADRUGA.

Branch road to
Madruga.

Branch to *Madruga* is very rough; *single track*, running first through heavy brush, then much cane to the left. Track runs nearly east toward the hills; cane the only crop, but country is brushy; would be *difficult but possible* for troops to march; many palms.

Railroad now among the hills; *cuts grow somewhat heavy*; much cane; country rolling and very broken; a *small bridge*; country grows more and more hilly, but hills often becoming open and clear, covered with sugar; a fine sugar region; railroad through *many high cuts*; one line of *telegraph*, two wires.

7. HABANA-MARIANAO RAILWAY.

This road runs from Habana to the city of Marianao, a distance of 8 miles, and is of much more importance than some of the longer lines in the province. It belongs to an English syndicate, with headquarters in London, and the stock, debentures, etc., are in English hands. It originally belonged to a Cuban company, but having become involved in difficulties, they liquidated and transferred their interests to the present owners. The road was built in 1863, and in 1883 opened a small branch line to a village on the coast. The rails used on this road are 60-foot steel and the track is standard gauge. The carriages and locomotives are of American type and are fitted with Westinghouse automatic brakes. It has an immense traffic, and is considered as a suburban line.

ROADS.

The principal roads of the province are—

1. From Habana to Coloma, 128 miles, 22 of which are in Habana Province. Page 238.
2. From Alquizar to Guanimar and Batabanó, 37 miles. Page 239.
3. From Batabanó to Habana, 35 miles. Page 242.
4. From Jaruco to La Boca, 12 miles. Page 244.
5. From Habana to Güines, 34 miles. Page 247.
6. From Regla to Minas, 10 miles. Page 248.
7. From Artemisa to Alquizar, 13 miles, 7 of which are in Habana Province.
8. From Güines, via Madruga, to Aguacate, 20 miles.
9. From Güines to Alfonso XII, 36 miles, of which 26 miles are in Habana Province.

1. HABANA-COLOMA ROAD.

TABLE OF DISTANCES.

HABANA.										
3	CERRO.									
4	1	GRANDES.								
8	5	4	MARIANAO.							
12	9	8	4	ARROYO ARENAS.						
14	11	10	6	2	PUNTA BRAVA.					
17	14	13	9	5	3	HOYO COLORADO.				
22	19	18	14	10	8	5	CAIMITO (PINAR DEL RÍO PROVINCE).			
128	125	124	120	116	114	111	106	COLOMA (PINAR DEL RIO PROVINCE).		

For table of distances from Caimito to Coloma, see Province of Pinar del Río.

The first two towns, i. e., Cerro and Grandes, are suburban towns of Habana and the itinerary will begin from Marianao, situated at the outskirts of the city and its suburbs, and is really a suburb of the city itself.

Distances from
Marianao.

Calzada from Marianao is a fine broad turnpike, capable of allowing three wagons to pass abreast. At first it passes over a rolling country, well cultivated on each side; many houses, to which side roads lead; fields cultivated with garden truck and corn, and road is often lined with stone walls. This country would not be difficult on either side of road, for march of troops. Road itself hard, probably never muddy, and smooth as a floor. Stage runs over it to Guanajay and Artemisa, and telegraph follows it.

2 miles.

Calzada, continuing over undulating country, reaches stone bridge and small stream, both unimportant, though latter probably contains a little water even in dry season. Beyond bridge a long slope leads to pueblito of Arroyo Arena, from which a road goes to left, leading to pueblito of Cano. Country on either side would answer well for cavalry maneuvers, though probably heavy in wet weather. Country is fairly level, interspersed with cultivated ground, with houses here and there, which are usually of stone and often thatched. Occasionally stone fences between fields.

3 miles.

Road reaches another pueblito, situated on first ridge after leaving Arroyo. Near it a little stream flows in wet weather. Country is cultivated, partly wooded in spots, undulating. There would be plenty of forage through here.

3½ miles.

Road crosses small stone bridge over small stream; to left are a few houses and the telegraph, probably to Guanajay. About half a mile beyond is a little village called Punta Brava. Here a road to left leads to a little place called Guatao; and another road to right goes to La Playa on gulf coast, about 5 miles away. This place (Punta Brava) is a small village lining the road, and beyond it is a stone bridge crossing a

little stream of seemingly good water, with low banks. Village lies some 6 miles from Habana, as marked by stones along the road. Country on each side is open and rolling. Distances from Marianao.
6 miles.

Road crosses a small stream also by a stone bridge; houses and hedges near by, and less than a mile beyond another small stream spanned by a very small stone bridge.

Road reaches some low ground; road, however, continues as before, a fine smooth turnpike. Some water and a small stone culvert at this point, about 14½ miles from Habana. Beyond lies a long slope. 7½ miles.

Calzada reaches the village of Colorado Hoyo, a long but small settlement lining road and possessing a small fonda. Country here is open, rolling, and cultivated, with palms scattered over it, but no brush. Just before reaching village a dirt road to the left goes to a private house (probably). 9 miles.

On further edge of the village a small stone bridge over a creek, now dry; but water lies to right. Some two miles beyond this the road crosses a small stream of no importance. Country is often intersected by stone walls, and in character is rolling and cultivated.

About 30 kilometers from Habana a ridge rises on the right, which runs toward road and seems to intersect, as it really does command it. To left lie low, cultivated fields and water—not a marsh, but seemingly a meandering stream. Large pond or small lake is indicated on the map, and probably exists in wet season. Within a few hundred yards of this ridge, and near middle of it, beyond water, lies the pueblito of Caimito. 14 miles.

2. ALQUIZAR, GUANIMAR, AND BATABANÓ ROAD.

TABLE OF DISTANCES.

ALQUIZAR.

11	GUANIMAR.
35	24 BATABANÓ.
37	26 2 LA PLAYA DE BATABANÓ.

ALQUIZAR TO GUANIMAR.

Alquizar, population 4,000 to 5,000, is low and flat; lies in rich and usually well-cultivated country. People active; half negro and half white. Water from wells and cisterns. Houses of stone or brick, one story. Streets paved. No naturally strong positions in surrounding country. Road crosses rail-road track a few hundred yards from station; goes a little west of south; is good and broad. Distances from Alquizar.

About ½ mile from the town small road diverges to west; to east lies splendid sugar estate of La Fortuna. Road now broad enough for 4 wagons abreast; between low stone walls. Country muddy in rainy season. About 1 mile road forks, one branch running west. At about 1½ miles this road turns 1 mile.

Distances from almost due south, passing through cane fields; no trees nor
Alquizar. brush, except the palms along the road itself.

2½ miles. Road crosses a road to sugar plantation on the east, and
now becomes bad, deep ruts and rocks obstructing the way.
3 miles. Sugar mill to west ¼ mile. At 3 miles from Alquizar road
crosses very narrow-gauge railroad to mill, and just beyond
splits into two branches, one east, the other curving north.
Great cane fields for miles on each side. Country level.

Road continues fairly good for wagons, but muddy in wet
season. A few hundred yards beyond is a pond to the west
of the road. Country hereabouts said to be infested by band-
its—"bandoleros." Here is a cuartel of the Guardia Civil,
300 yards beyond which is an old road to the west.

4 miles. At 4 miles a road makes off to the west. Country to the
west brush-covered; to east, cane. Road smooth and good,
room for 4 wagons abreast, but muddy in rainy season.

5 miles. Dirt road branches off to Batabanó, 9 Cuban leagues dis-
tant. A fonda or inn here and the place is called Guanimar,
and is absolutely insignificant. Country flat and muddy in
rainy season. A few hundred yards beyond, a cross road
runs east and west; brush is more frequent. Bananas and
yucca the chief crop. Stone wall about 5 feet high on west,
and cactus hedge on east side of road. At 5½ miles the road
turns sharply to west for three-fourths of a mile; country to
north brushy, to south more open, with brush beyond. At
6¼ miles, road turns sharp south; brush on both sides; turns
again west 200 yards farther. Troops and wagons could
march (dry season) in country on each side, but cavalry
would find difficulty, on account of the brush. Road now
wide enough for only two wagons.

7 miles. Country more open to south; to north brush continues. A
road breaks off to south here; the main road still continuing
west. At 7½ miles a large sugar mill one-half mile to the
south. Country open; cane fields.

8 miles. A large house with huts and meadows to the north; road,
between rough stone walls, turns to the south; stone fence
to east and cactus hedges to west; road grassy and not so
muddy in wet season; after 500 yards turns west. Road now
turns south again, the larger branch continuing westward to
Las Mangas. At 9¼ miles a mud hole, due to springs of
Guanimar River, rising hereabouts. The road proper stops
here. A bridle path over low swampy ground leads to the

10 miles. sea, running on a low causeway with a ditch on each side,
water in each about a foot or so deep. Surface of marsh will
bear a man's but not a horses' weight (dry season). There
are two of these causeways from Guanimar. The eastern
causeway varies in width from 8 to 20 feet; built to some
extent of rock, and water in its ditch is clear and good and
even in dry season has a current. In wet season these ditches
are navigable for small boats carrying troops.

LA PLAYA DE GUANIMAR.

Said to be the best harbor of the southwest of Cochineros Bay. A little fishing village on a low, flat shore. In wet season the causeways mentioned can not be used, and communication with Guanimar from the interior is by boat along the ditches already spoken of, the water of which is fresh to 100 yards of the point where they empty into the sea.

Population of Guanimar is 300 or 400. There is one pier running about 200 feet from shore. Ten feet of water can be carried to 600 or 800 yards of shore at mouth of river. Place said to be excellent for landing a small force to seize the western railroad, because, other things equal, the enemy would never suspect an attack from this quarter. Distance from Guanimar proper, 8½ miles, and from the Playa de Guanimar to Alquizar, 13½ or 14 miles.

ROAD FROM GUANIMAR TO BATABANÓ.

Leads due east and wide enough for two wagons. Country level; palms; roads to the south within first few hundred yards. At three-fourths of a mile road turns north for 300 to 400 yards, then east again. At 2½ miles road forks. The southern branch is wide enough for two carts. Meadows, no brush.

Distances from
Guanimar.

1 mile.

At 3 miles, a large sugar mill to the south. Country open; bananas. At 3½ miles cross road north and south. Road now single track. Plenty of grass.

3 miles.

4 miles.

At 4½ miles, road turns ENE. Sugar mill 1 mile directly ahead.

Many intersecting local roads through here. At 7 miles a main road runs due south. The road east wide enough for four wagons. At 7½ miles, a brushy ridge three-fourths of a mile to the south.

7 miles.

Country becomes wilder. Local roads come in from right and left. Water apparently all from wells and cisterns, as none to be seen in dry season along road. Stone fences visible to north. Fields begin to show rock. Travel in fields very difficult on account of the "dog's tooth violet" (diente de perro) out-crop. Road between stone fences, great meadows, some brush. Broad road runs off to north. Meadows dangerous for horses, etc., on account of dientes de perro. A house, "la Espirituana," to the south one-half mile. Country generally level, but 2 or 3 miles to south a ridge of low, wooded hills. Country brushy and grass-covered.

8 miles.

9 miles.

10 miles.

11 miles.

Road divides into three, middle one due east, and very bad, but still passable for wagons in single file. Country on each side impassable for horses.

12 miles.

Road up to this point almost impassable for wagons. Country overgrown with brush. Here road begins to improve, single track.

14 miles.

Distances from
Guanimar.

16 miles.

17 miles.

19 miles.

20 miles.

21 miles.

24 miles.

Cultivation begins. No water to be got along here, except from huts. Road good; wide enough for three wagons; muddy in wet weather. A large sugar mill in neighborhood, with its narrow-gauge road. An arroyo just before reaching the mill, called the "Ingenio Central Andrea." Passing the mill, road goes northeast, between hedges, grass-grown, and wide enough for three wagons. To the north, at some distance, a range of hills. Road forks, the left (north) branch going to Batabanó. Here a good-sized pond to the left. Road improves.

Road forks, southern branch going east, excellent; stone walls; wide enough for six wagons, but is muddy in wet weather; country open. Meadows, cane, brush. At 21 miles a road leads off to the south. A little farther on, the railroad from Habana to La Playa de Batabanó. Beyond railroad, road continues good, and leads into the town of Batabanó, about 2 miles; is invisible from railroad. Country cultivated (cane); trees and hedges. At three-fourths of a mile from track road turns north; main road goes on to Batabanó, 24 miles from Guanimar.

BATABANÓ TO LA PLAYA DE BATABANÓ.

1 mile.

Road good, a little west of south, almost a calzada, probably never muddy; wide enough for three wagons. Brushy fields on both sides, soon becoming swampy. Telegraph follows road a short distance. Streams of clear water. Country round about suited to all three arms. Habana Railroad to the west, railroad and road meeting at La Playa de Batabanó; intervening ground swampy. La Playa is 2 miles from Batabanó.

3. BATABANÓ-HABANA ROAD.

TABLE OF DISTANCES.

BATABANÓ.

3	POZO REDONDO.			
9	6	SAN FELIPE.		
14	11	5	BUENA VENTURA.	
17	14	8	3	BEJUCAL.
20	17	11	6	3 RINCÓN.
22	19	13	8	5 2 SANTIAGO DE LAS VEGAS.
26	23	17	12	9 6 4 CALABAZAR.
29	26	20	15	12 9 7 3 ARROYO NARANJO.
35	32	26	21	18 15 13 9 6 HABANA.

ITINERARY OF ROAD.

Leaving Batabanó the road passes first through gardens^s growing vegetables, sugar cane, bananas, and other fruits, and surrounded, as a rule, by stone walls or cactus hedges. From amidst these inclosures rise the frail thatched huts.

From Batabanó the road crosses a flat, hot country, somewhat covered with brush, until the railway station and watering place of Pozo Redondo, 3 miles distant, is reached. From this point the road follows the railway (Habana-Batabanó "Ferrocarriles Unidos") across a somewhat barren region, covered with brushwood, the soil becoming more sterile and strewn with stones. After a sugar estate called Santa Lucia, from which, a little sugar railroad, looking like a child's toy, ran down to the main line at the station, the road continuing along the rail, soon reaches an open flat country covered with cane and grass land, with huts scattered here and there, inclosed by hedges and stone walls. Far away to the north and west can be seen a range of hills, the heights near Bejucal; cattle are seen more frequently, and the appearance of the country begins to improve; underbrush becomes more scanty, and finally the region becomes an open plain, over which groups of royal palms are scattered. The road still running parallel to the railway becomes somewhat bad, cut into deep ruts in the dry season, indicating that it is almost impassable during the rainy period. Further along the region becomes more a wide flat prairie, little cultivated, whose covering is chiefly a coarse grass, not good for food, even for cattle. Beyond this, fields of cane again appear, until the town of San Felipe is reached, which is the junction of the two branches of the Habana Railway, i. e., Habana-Batabanó and Habana-La Unión. The town is of no importance except as a railway junction.

Distances from
Batabanó.

2 miles.

From San Felipe the road continues west, following the railway through a rolling fertile country, highly cultivated with cane, great waving fields of which extend to Quivicán, a railway station, for its shipment. Shortly beyond this point the road and railway separate, the former passing through a similar country, whose fields seem well cultivated, and whose habitations indicate a prosperous people.

9 miles.

About 16 miles from Batabanó, on this road, is located the village of Buenaventura, beyond which the pike traverses a prosperous and fertile region and soon approaches the railway, running parallel with it over a rolling country, which becomes somewhat barren and stony, gradually approaching a long range of hills until the town of Bejucal is reached.

14 miles.

From Bejucal to Habana the road is an excellent pike; north of the latter city it runs along the lower slopes of the range of hills, giving a fine view of the plain which extends far away to the southern coast. The region is pleasantly diversified by groves of bananas and clumps of palms standing amidst fields of cane and corn; on the left is the railway, until the town of Rincón is reached.

17 miles.

The road from Rincón passes through a highly cultivated region, open and rolling, with good houses here and there. To the right are low hills, slightly brushed-covered, until a thriving little town called Santiago de las Vegas is reached.

20 miles.

Distances from
Batabanó.

22 miles.

Leaving Santiago the road continues directly north, leaving the vicinity of the ridge it has followed from Bejucal, and passes through an undulating country across the railway (Ferrocarril Occidente), it reaches the hills from which may be seen a valley bounded northward by the heights surrounding Habana, into which it descends, crossing over a long bridge spanning the headwaters of the Almendares River, to the town of Calabazar.

26 miles.

Passing through the village just mentioned the road begins to ascend the hills beyond by an easy grade, the region on either side being somewhat rocky and brushy, with gullies here and there, until near the summit a village called Arroyo Naranjo is reached.

29 miles.

Continuing on through the town the road traverses a beautiful country, on either side of which rises open, rounded and grassy hills. On the summit of one stands a house known as La Ascencion. From here the road slowly descends to the valley below, passing in gentle curves around and over the grassy hills that lie between the valley and Habana, until the village of Vibora, lying near the outskirts, called Jesús del Monte, is reached, and thence into the city of Habana.

35 miles.

4. JARUCO-LA BOCA ROAD.

TABLE OF DISTANCES.

JARUCO.	
10	MATIAN.
12	2 LA BOCA.

ITINERARY OF THE ROAD FROM JARUCO TO LA BOCA.

Distances from
Jaruco.

4 miles.

Leaving Jaruco going due north the road soon becomes rocky and bad, bordered by stone walls, and passing over a rolling country, chiefly planted with corn, and dotted, of course, with palms singly and in groups. At first the road is used by wagons, and is wide enough for two to pass, but there is only one wagon track; and though over a soft white rock, it becomes very muddy, no doubt, in wet weather. Gradually descending the ridge on which Jaruco lies, the road crosses a little rivulet and mud hole some miles from the town; rocks and a little brush. Beyond this crossing the road, now a single track, crosses two other small rivulets, and a hundred or two yards beyond, another, near which are huts and cornfields, and to the right and left bushy hills, probably half a mile away. Along the road, however, the country is open and cultivated and there are many huts, with cattle here and there. Beyond, there is another small rivulet across the road, making a mud hole.

At a little fonda, a road comes in from the west. The road now is hardly more than a bridle path, continues on to the right

over the hills, and runs for a time about northwest. Wagons could perhaps travel here, but it would be with difficulty. The country here is rolling, dotted with palms, with meadows, and here and there huts and corn fields. Half a mile from the fonda another small rivulet is crossed, probably a tributary of the Rio Jaruco. Here trees are more common; there is also more brush; huts are to be seen, and the road continues about north-by-west, crossing a few yards from the last another small rivulet. The chief crop seems to be corn, growing from a whitish soil, but a little cane is also produced. The road here is passable for wagons, and there is a wagon track, but it is hardly a well-marked road.

The Rio Jaruco is reached, which is here about 6 inches deep and perhaps 15 feet wide; water clear and current swift; a good gravelly ford with sloping banks. It is probable that this can be forded here by wagons at all seasons. Near by are huts; many places exist here favorable for ambush, but troops could move in general over the country without great difficulty, the country being about as good as the road; the latter could be readily made into a good wagon road. The road is now improving, and passes the huts of a pueblo called the Ingenio de Martin, where there is a very little cane, corn, and a few huts. The road here is running a little west of north, and apparently becoming very muddy in wet weather. The country is clear, open, and cultivated, but with a range of fine high wooded hills lying to the eastward.

The Ingenio de Martin is about 6 miles from Jaruco, and has probably but little cart traffic with that place. Perhaps half a mile beyond here the road descends into a beautiful open valley, some 3 or 4 miles across, in which there is cane and fine meadows stocked with cattle; and far away in the opposite range can be seen the opening through the bold range of coast hills which mark the Boca de Jaruco. In this fine valley there are few palms and no brush; the road is better and more distinctly marked, lying here between cactus hedges. It is very wide, and seems to grow muddy in wet weather. The road descends by a gentle slope into the valley, and crosses a very little wooden culvert over a tiny rivulet near the bottom. Near by are fields of corn.

A very fine ingenio some 400 yards to the right of the road. Here the road crosses another going to the left to San Miguel.* The valley is fertile, but many of the surrounding hills are bare, uncultivated, or wooded. The road is now much better.

* This road seems quite well worn and better than parts of the road to Jaruco. It is stated, however, that it is not as good. This, however, is probably not so, because it is evidently the outlet for the sugar mill, unless it turns and goes to Jaruco. In case of an attack from the mouth of the Jaruco, however, it would be an advantage to strike the railroad at San Miguel and avoid the cuts near Jaruco. Cavalry and probably wagons could move to San Miguel from Los Almacenes by this road.

Distances from Jaruco. The main road turns to the left. From this point a fair road continues toward a break in the range of hills, through cane and past a few houses, and approaches a pueblcito.

8½ miles.

9½ miles.

The last-named road again crosses the Jaruco River. The stream here is some 15 feet wide, with brushy banks, generally steep and some 10 feet high. The ford is good, the bank sloping here. There is little mud, and the bottom hard and gravelly. Water a foot or two deep. Some half a mile beyond a little town is perched upon a hill. Before reaching this, however, the road crosses a little shallow stream, some 10 feet wide, by an old log bridge, and enters Los Almacenes (also known as San Martín). The town is on a small hill. There are two or three fondas, and probably 500 people, and a cemetery. Houses of stone and of wood, chiefly of the latter. The road continues for a few hundred yards beyond to a warehouse or two on the bank of the river Jaruco, where there are also a few huts. To this point—some 3 miles from La Boca—small schooners run up the river to load sugar; hence the name, Almacenes—warehouses.

The river is somewhat sluggish, and less clear than before; the right bank is high, firm ground, but the left is low and covered with mangroves. At the stopping place—the warehouse on the right bank—there is said to be about 1½ fathoms of water. Going down the stream by boat, the river widens. It flows through mangroves and low ground at first, but presently reaches the mountains, which rise rugged and brush-covered far overhead, reminding one—to compare small things with great—of the banks of the Hudson about Storm King. The river, of course, is hardly a tenth the size of the Hudson, but the hills on either side are nearly as high as Storm King, fully as bold and rocky, and densely covered with green brush, with caves here and there where the Zapalotes (Aories?) made their homes. Still the river flows sluggishly between mangroves, though very deep, it is said, in this part. From Los Almacenes to La Boca no road is possible, but it is said that carts sometimes reach La Boca from the eastward, where the mountains can be crossed.

From Los Almacenes to La Boca the distance is perhaps 3 miles. A little sandy playa runs out from the higher bank on which the town lies in one long street. The river is here of considerable width. La Boca is a town of perhaps 200 or 300 people, lying on the left (western) bank: composed chiefly of huts, and has several fondas. There are no roads leading from the place, shut in as it is by high hills, almost mountains. The western bank terminates in a little brushy point of land where there is the ruin of a little Martello tower, no doubt a relic of old piratical days; this is abandoned and gone to decay; around it is a loop-holed wall of brick designed for musketry. The mouth of the river is here some 500 or 800 yards across. The east side is low, rocky, and brushy, and has no defenses or settlements at the point. There is little soil on either point.

The Rio Jaruco runs nearly north and south. At its mouth it is a fine stream, said to contain $2\frac{1}{2}$ fathoms of water opposite the town. It is entirely unprotected, and can with difficulty be reached except from the sea. Above, no road is possible until within some 1,500 or 1,600 yards from Los Almacenes. The shore at the mouth is low and shelving, and the town some 500 yards up the stream and on the west or left bank. This is an excellent boat landing. The bar is said to have 7 feet of water. Some miles from the town of Los Almacenes it is possible to land on the right or east bank of the river. From here there is said to be a cart road over level country to the town, but no doubt this becomes muddy. The town at La Boca is composed of some 20 huts and houses. The town of Los Almacenes is strongly placed, and field guns here would make a landing difficult. The warehouse on the right bank of the river mentioned is small. There is a little wooden dock here. The bank here is some 3 or 4 feet high, a good landing place on firm ground; the other bank is low and lined with mangroves above, below, and opposite the warehouse.

It is said that from Jaruco to the mouth of the Jaruco River the road is not only better but shorter than from San Miguel there. No special difficulties would probably be met should a landing be effected at La Boca and the town of Los Almacenes captured. The intervening country is well watered, and wagons and supply trains could pass with perhaps some improvements of existing roads. But the town of Jaruco is strongly placed, and a landing ought not to be made at La Boca unless an auxiliary to an advance from Matanzas. Such a country offers many advantages to the defense. From Jaruco to La Boca the distance is estimated to be 12 miles; 10 to Los Almacenes, and 2 to La Boca.

5. HABANA-GÜINES ROAD.

TABLE OF DISTANCES.

HABANA.									
3	JESÚS DEL MONTE.								
4	1	LUYANÓ.							
8	5	4	SAN FRANCISCO DE PAULA.						
16	13	12	8	CUATRO.					
19	16	15	11	3	JAMAICA.				
20	17	16	12	4	1	SAN JOSÉ DE LAS LAJAS.			
29	26	25	21	13	10	9	CANDELARIA.		
34	31	30	26	18	15	14	5	GÜINES.	

ITINERARY OF ROAD.

Distances from Jesús del Monte.	This road properly commences at Jesús del Monte, a suburb of Habana, and runs south of east until it reaches the town of Luyanó.
1 mile.	
2 miles.	From here it takes a more southern course; on the left is a range of hills and on the right the river Layanó, a branch of which it crosses at a distance of 4 miles, and thence to San Francisco.
4 miles.	As it leaves the town it skirts some hills on its right, while on the left is a low, rolling country. It then enters a low, flat country, passing over the head waters of the Almendares River, through the village of Cuatro Caminos.
5 miles.	Immediately after leaving this town it crosses a bayou, and then slowly ascends and crosses over some hills, from which it descends to the town of Jamaica.
13 miles.	From here to the town of San José de las Lajas, a distance of 1 mile, the country is quite level.
16 miles.	Shortly after leaving San José the road passes a small creek and runs through an undulating region a distance of 11 miles, when it ascends and winds through the hills of Candelaria, among which is situated the village of the same name.
24 miles.	From here it gradually descends into the valley, below which it crosses numerous little creeks and enters the city of Güines, at a distance of 34 miles from Habana.
26 miles.	
34 miles.	

6. REGLA-MINAS ROAD.

TABLE OF DISTANCES.

REGLA.		
2		GUANABACOA.
10	8	MINAS.

ITINERARY OF ROAD.

Distances from Regla.	Commencing from the city of Regla, this road runs east over a level, fertile country, to the city of Guanabacoa.
2 miles.	
3 miles.	From here, for a distance of 3 miles, it traverses a rich, undulating country, when it gradually ascends and crosses over the high hills known as Lomas de Sa. Fé, from the summit of which can be seen the village of Minas in the distance.
6 miles.	Ascending to the valley, it crosses over a low, flat region, with many little creeks, and enters Minas at a distance of 10 miles from Regla.
10 miles.	

9. GÜINES-ALFONSO XII ROAD.

TABLE OF DISTANCES.

GÜINES.			
10			ST. NICOLAS.
23	13		NUEVA PAZ.
36	26	13	ALFONSO XII (MATANZAS PROVINCE).

JUDICIAL DISTRICTS, TOWNSHIPS, CITIES, AND TOWNS.

Judicial district (partido judicial).	Township (ayuntamiento).
Bejucal	{ Batabanó. Bautá (Hoyo Colorado). Bejucal. Cano (El). Isle of Pines. Nueva Gerona. Quivicán. Salud (La). San Antonio de las Vegas. San Felipe. Santiago de las Vegas.
Guanabacoa	{ Guanabacoa. Managua. Regla. Santa Maria del Rosario.
Güines	{ Catalina. Guara. Güines. Madruga. Melena del Sur. Nueva Paz. Pipian. San Nicolas.
Habana	Habana.
Jaruco	{ Aguacate. Bainoa. Casiguas. Jaruco. Jibacoa. San Antonio de Río Blanco del Norte. San José de las Lajas. Tapaste.
Marianao	Marianao.
San Antonio de los Baños	{ Alquizar. Ceiba del Agua. Guira de Melena. San Antonio de los Baños. Vereda Nueva.

I. JUDICIAL DISTRICT OF BEJUCAL.

Area, 180 square miles.

Townships.	Population.
1. Batabanó	8,518
2. Bauta (Hoyo Colorado)	8,332
3. Bejucal	8,972
4. Cano (El)	4,040
5. Isle of Pines	3,000
6. Nueva Gerona	
7. Quivicán	6,000
8. Salud (La)	4,970
9. San Antonio de las Vegas	4,649
10. San Felipe	
11. Santiago de las Vegas	11,000

1. AYUNTAMIENTO OF BATABANÓ.

Capital, Batabanó.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Guanabo	7	1,162 inhabitants.
2. Mayagüano	2½	653 inhabitants.
3. Pozo Redondo	3½	896 inhabitants.
4. Quintanal	1	1,423 inhabitants.
5. Surgidero	2½	2,522 inhabitants; telephone.

ROUTES TO BATABANÓ.

1. From Habana by United Railways.
2. By pike, following railroad route.
3. From Santiago de Cuba or Guantanamo by sea.

BATABANÓ.—A town of 1,860 inhabitants, situated 37 miles south of Habana. Its port is of a sufficient size to accommodate boats of 12 feet draft. This port has 4 lines of coasting steamers for the following places: Santiago de Cuba, Vuelta de Abajo, and the Isle of Pines. They run regularly. Its principal industries are fishing, large quantities of fish being imported to Habana; sponge gathering, and sugar raising. There are here immense plantations which are inexhaustible resources for the production of sugar cane. Military command and naval station, board of education, first-class lighthouse, post office, telegraph station, and railroad to Habana.

This town is located directly on the seashore, on a low, marshy, ill-drained flat, about 3 feet above the level of the sea. It is a filthy, repulsive-looking place, containing a super abundance of materials for decomposition and putrefaction. Buzzards abound on the housetops. Swamps are

plentiful, and nothing could be more gloomy than the aspect of these marshes around Batabanó. Pezuela states that in consequence of these marshes it is a very unhealthful locality. In front of the town is a shallow open sea. It has no harbor, is not a port of entry, and is commercially of no importance, except as the connecting link between the railroad from Habana and two steamship lines. Population mostly seafaring. The annual range of temperature is from 64.4° to 90.4° F. The death rate runs from 50 to 80 per thousand.

There are really two towns called Batabanó; one, a small town $2\frac{1}{4}$ miles inland, having houses of wood, with tiled roofs. The seaport of that name above described, more properly called La Playa de Batabanó (also called Surgidero de Batabanó), being much the larger, and the real place of importance. The port of Batabanó is the railroad terminus and is connected with the interior by a very good turnpike.

SAILING DIRECTIONS.

THE GULF OF BATABANÓ, between Padre Point and Mangle Point, a distance of 160 miles, is bordered on the south side by the Bank of the Jardines and Jardinillos, the Isle of Pines, and the islands known as the Mangles, Indian, and San Felipe Groups. To the northward of these groups are almost innumerable cays and sand banks, as yet very imperfectly known, and forming numerous and intricate channels. To navigate these channels and to identify the cays used as landmarks, local knowledge is positively necessary. The principal channels leading to the road of Batabanó are: From the eastward, the Gordas Channel, between the mainland and the Juan Luis Cays; from the southward, the Rosario Channel, along the western edge of the Jardinillos Bank; and from the SW. the channel between the Isle of Pines and the Indian Cays, between the Indian and San Felipe Cays, and between the latter group and the mainland.

Pilots and masters of steamers running constantly to Batabanó have asserted that vessels drawing 11 feet can go there with safety.

Pilots may be obtained at Cienfuegos or at the Isle of Pines.

Batabanó is 9 miles to the westward of the Mayabeque River, and is a place of constantly growing importance as a port through which nearly all the communication of Habana with the southern coast of the island takes place. A railway runs to Habana, time two hours, and the submarine telegraph cable is here connected with Habana by land lines.

The channels leading to this port only admit of the passage of vessels drawing 12 or 13 feet of water, and the anchorage is entirely exposed to SE. winds. There are but few scattered buildings on the shore, the town of Batabanó lying 3 miles inland.

Lights.—A fixed white light is shown from a mast, and is visible 4 miles. At the end of the railroad company's dock is another light, fixed white, visible 6 miles.

BATABANÓ CHANNELS.—Cayamas Point forms, with the chain of cays southward of it, the channel of the same name, in which there are only 6 feet water. These cays run in a SSE. direction for 11 miles, where they form, with another chain extending 13 miles eastward, the channel of Hacha, with 7 feet water in it, which is much frequented by small vessels leaving Batabanó or proceeding to it westward of the Isle of Pines and San Felipe Cays.

Cruz Cay, the eastern of the latter chain, lies nearly S. 10° E. (S. 14° E. mag.), 15 miles from Batabano, and at a little distance westward of it is Redondo Cay, under the lee of which small vessels find shelter from the strong SE. winds, from July until October, to which the whole coast is exposed.

At 6 miles southward of Cruz Cay is Monterey Cay, forming a channel between, with $2\frac{1}{2}$ fathoms water, mud bottom. This channel is the widest of these which afford a passage to vessels to or from Caimito, Rosario, and Batabanó. From Monterey a ridge of rocks extends to the SW. for 8 miles. When westward of this reef the several heads of rocks southward of the cays on the north side of the channel should be avoided.

Directions to Batabanó.—If bound to Batabanó through the Gulf of Czones, steer up the gulf so as to make Diego Perez Cay on the port bow. Skirt the reef until the south part of this cay bears about N. 75° W. (N. 79° W. mag.), when a vessel may haul round the dry point of the reef and steer for the south part of the cay, and with a good lookout she will have not less than 10 feet water. Give the end of Diego Perez Cay a berth of about $\frac{1}{2}$ mile, leaving the lightvessel on the starboard hand, and the water will deepen to 2 and 3 fathoms, but with an irregular bottom and rocks in all directions. When abreast of Diego Perez, steer to pass 600 yards from Flamenco Cay; a greater distance off is unsafe.

After passing Flamenco Cay, steer to pass midway between Rabihorcado Cay on the port bow, and Bonito Cay and the rest of the range of cays on the starboard. A depth of 3 and 4 fathoms will be carried on this course, but when abreast of Rabihorcado the water will rapidly shoal to 9 feet, over a white, sandy bottom and occasional patches of rock which are easily distinguished. The latter depth will be carried for about 12 miles, on a N. 86° W. (west mag.) course, when it will gradually deepen to $2\frac{1}{2}$ and 3 fathoms, with the same white bottom and patches of rocks.

GORDAS CHANNEL.—In a vessel of not more than 8 feet draft, this channel may be advantageously taken, in preference to going round the rocky spit which projects 7 or 8 miles to the southward from Monterey Cay. To enter this channel, when the south end of Ambar Cay on the NW. side of the channel bears N. 41° W. (N. 45° W. mag.), distant $\frac{1}{2}$ mile, steer about N. 26° E. (N. 22° E. mag.), keeping Ambar Cay about $\frac{1}{2}$ mile on the port hand, and taking the precaution of having a boat sounding ahead, so as not to come into a less depth than 9 feet, soft mud.

The water will soon deepen to 2 and $2\frac{1}{2}$ fathoms, and a course can be shaped for Batabanó. Give Cruz Cay a wide berth in passing, as the depths near it are not known. There are no dangers between Gorda Point and Batabanó, but regular soundings of $2\frac{1}{2}$ and 3 fathoms; the distance, however, 19 miles, appears to be over represented on the charts, and at night not more than 12 miles should be allowed as the run between.

Towards Batabanó the soundings will decrease slowly and regularly. The anchorage is open to the southward, and may be recognized by a pier projecting about 400 yards from the mangrove shore. At 200 yards from the pier head the depth is 10 feet.

HACHA CHANNEL.—Bound to Batabanó from the westward of the Isle of Pines, from a position 2 miles westward of Dios Cay, in $2\frac{1}{2}$ fathoms water, steer N. 38° E. (N. 34° E. mag.), carrying about 3 fathoms, until the Guanima Cays are sighted, which, with all the cays in their locality, are so exceedingly low as to often cause great perplexity. When these cays are

made out, the water will shoal to $2\frac{1}{2}$ fathoms, when steer N. 71° E. (N. 67° E. mag.) until 2 or 3 miles northward of the Petatillos Bank, which runs east and west. Run along this shoal at that distance, carrying $2\frac{1}{2}$ and 3 fathoms, until Culebra Cay bears S. 38° W. (S. 34° W. mag.), when the Hacha Channel will open out, bearing N. 38° E. (N. 34° E. mag.).

Steer directly for the passage, and in running through take care to avoid the mud bank on its eastern side; navigate it with a boat ahead, keeping nearer the western shore than the eastern, and 9 feet will be carried over soft mud. When clear of the channel, a course can be shaped for Batabanó.

2. AYUNTAMIENTO OF BAUTA (HOYO COLORADO).

Capital, Bauta (Hoyo Colorado).

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Baracoa	5	
2. Cangrejas	$7\frac{1}{2}$	
3. Corralillo	$1\frac{1}{2}$	
4. Cruz de Piedra (or Camino Real)	$6\frac{1}{2}$	
5. Guatao	6	
6. Portazgo (El) or Punta Brava	4	
7. Santa Ana	5	

BAUTA (HOYO COLORADO).—A town of 2,000 inhabitants, situated 17 miles from Bejucal. Produces tobacco in abundance. Post office.

3. AYUNTAMIENTO OF BEJUCAL.

Capital, Bejucal.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Aguas Verdes	$\frac{1}{8}$	
2. Beltran	$\frac{1}{2}$	
3. Jesús Maria	$2\frac{1}{2}$	
4. Piedras	$\frac{1}{2}$	
5. Poveda	$\frac{1}{2}$	
6. Santa Bárbara	$5\frac{1}{2}$	
7. Viajacas, or Biajacas	4	

ROUTES TO BEJUCAL.

1. From Habana by United Railways.
2. From Habana by pike.

BEJUCAL is a town of 6,239 inhabitants, capital of the judicial district of the same name, situated 17 miles from Habana. Boards of agriculture,

charity, education, and health. It has a jail, casinos, and hospital. United railroads of Habana. Post office and telegraph station.

This city was founded in 1710. It is about 300 feet above the sea, located at the foot of a chain of hills, from the summit of which the Morro light at Habana can be seen. Pezuela reports that the longevity of its inhabitants is remarkable, as also the beneficial influence which its healthful air exercises on the invalids who visit the place. Bejucal is characterized by small, one-story buildings, dirty, mud streets, low floors on a level with the streets, and filthy surroundings. In the outskirts there are wretched palm huts. Many of its houses are of stone. South of the hills already mentioned the surrounding country is open and fairly level. A stream surrounds the town, which, though full in the rainy season, during a greater part of the year consists chiefly of pools, each one constituting a focus of swamp poison. The death rate is about 25.7 per thousand. Yellow fever is not prevalent here. There are never more than 15 or 20 cases, and some years none. New arrivals are those which are attacked.

4. AYUNTAMIENTO OF CANO (EL).

Capital, Cano (El).

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Arroyo-Arenas	2	Post office.
2. Santa Ranas	2	
3. Cuatro Caminos de Falcon.	4	
4. Jaimanitas	5	

CANO (EL) is a town 12 miles from Bejucal, on the highroad from Habana to San Cristóbal, 10½ miles from the former place. It is watered by several streams which empty into the Playa de Jaimanitas river.

5. ISLE OF PINES.

For description, see page 257.

6. AYUNTAMIENTO OF NUEVA GERONA.

Capital, Nueva Gerona.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Santa Fé	13½	Telegraph station.

NUEVA GERONA is a town of 500 inhabitants, situated 80 miles from Bejucal. Capital and chief city of the Isle of Pines. Post office.

For description, see page 257.

7. AYUNTAMIENTO OF QUIVICAN.

Capital, Quivican.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Arango	$\frac{1}{2}$	
2. Delicias	$\frac{1}{2}$	
3. Güiro Marrero	$2\frac{1}{2}$	
4. Jaiguan	$4\frac{1}{2}$	

QUIVICAN is a town of 2,108 inhabitants, situated 8 miles from Bejucal. Board of health, board of education, post office, and railroad to Matanzas. Center of fine cattle-raising district.

8. AYUNTAMIENTO OF SALUD (LA).

Capital, Salud (La).

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Buena Ventura	$2\frac{1}{2}$	
2. Güiro de Buningal	$2\frac{1}{2}$	

SALUD (LA) is a town of 800 inhabitants, situated 5 miles from Bejucal. Chief city of the Ayuntamiento. Two county fairs annually. Post office. On railroad between Habana and Pinar del Río, 19 miles south of the former. Situated chiefly on the left (south) of the railroad. Water tank, cattle chute, and two side tracks.

9. AYUNTAMIENTO OF SAN ANTONIO DE LAS VEGAS.

Capital, San Antonio de las Vegas.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Durán	2	

SAN ANTONIO DE LAS VEGAS is a town of 1,136 inhabitants, situated $13\frac{1}{2}$ miles from Bejucal. Cattle of every class are bred here, also horses, mules, and swine. It has a board of education, a board of health, and an industrial commission. The nearest station is Durán, 2 miles away. Post office and telegraph station.

10. AYUNTAMIENTO OF SAN FELIPE.

ROUTES TO SAN FELIPE.

1. From Habana by United Railways.
2. From Habana by Batabanó pike.

SAN FELIPE is a town of 2,311 inhabitants, situated 9 miles from Bejucal. Post office.

The site of San Felipe is flat; the town old and tumble-down. The houses are chiefly of wood, with tiled roofs, and the streets are roughly paved with stone. The railroad station is a small wooden shed, through which the train passes, and at the eastern end divides into two single-track lines, going east to Alfonso XII and La Playa de Batabanó. Within the station are several tracks and a water tank.

San Felipe has no defensive advantages of position, and could probably be taken with ease. However, it would be difficult to set on fire, on account of the tile roofs generally used. It is of importance strategically, as being the intersection of two important lines of advance toward Habana, viz, one from the port of Batabanó by road and railroad, the other from Matanzas and the east, via Empalme and Güines. The common road from Batabanó reaches the town about the point of entry of the railroad from the south. The country about San Felipe is largely covered with a tall growth of sugar cane.

11. AYUNTAMIENTO OF SANTIAGO DE LAS VEGAS.

Capital, Santiago de las Vegas.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Aguada del Cuba -----	3	Habana Railroad.
2. Boyeros -----	2½	970 inhabitants. Western Railroad.
3. Calabazar (or Nueva Cristina).	3½	1,500 inhabitants. Western Railroad, post office, and telegraph station.
4. Doña Maria -----	1	
5. Potrero Ferro (or Mazorro).	3¼	10 miles from Habana. Habana Railroad to Santiago.
6. Rincon de Calabazas ..	2	Western and Habana railroads, post office, and telegraph station.

SANTIAGO DE LAS VEGAS is a city of 6,200 inhabitants, situated 4½ miles from Bejucal and 13 miles from Habana. Boards of health, charity, and education. Four clubs, hospital, and lunatic asylum. Post office and telegraph station.

Santiago was founded in 1688. It is situated on an elevated plateau within a mile of the southern railroad, which runs from Habana via Bejucal and Güines to Matanzas. The houses are one story high, and chiefly of stone. It has two side tracks and cattle chute, but no water tank.

There is a large campo santo (cemetery) with quite high stone walls on the right. The country is flat and well cultivated.

Death rate said to be as low as 25. Pezuela reported in 1855 "Santiago is one of the most healthful places on the island, and has escaped epidemics of cholera and small-pox."

ISLE OF PINES.

ROUTE.

The favorite route for reaching the island is by light-draft steamer from Batabanó, which runs once or twice a week.

The island is situated between 21° 24' and 21° 56' north and 82° 30' and 83° 12' west, 90 miles from Habana, and 60 miles from Batabanó. It is in the Antilles Sea, belonging to a group of islands of which it is the largest. It has no great depth of water around it, except at Ensenada de la Sigüanea, where charts show from 3 to 7 fathoms. At Punta del Este protected anchorage can be had for vessels drawing from 14 to 15 feet.

The island is peculiar in shape, resembling a volante. Its extent is about 45 miles from east to west and 33 miles from north to south. South of the middle an enormous swamp (La Ciénaga) extends from Sigüanea Bay to the east coast. North of this the island is high and rolling, covered chiefly with palms and pines, and generally with low coasts, except a portion of the north coast where a range of hills comes down to the sea. There are mountains here which are over 1,500 feet above the sea level. The principal heights are the Cañada Ridge, Mount Daguilla, Caballos, Casas del Sur, and Norte Ridges, Mount San Pedro, and Mount Montelayo.

In making the land from the southward, three mountains come in sight. Of these the westernmost and highest, called Dolphin Head, or Mount José, appears from the south as one peak, but from the westward three peaks are seen. They can be seen 45 miles off. From the summit of the mountains at La Cañada one can see nearly the whole of the west coast. To the west and south is a long sweep of low coast line, indented here and there by the mouth of a river; of these La Nueva is said to be the best river entrance of the island. The other important rivers are Las Nuevas, Casas, and Santa Fé; all navigable. Those that go to Nueva Gerona and Santa Fé are navigable for three or four miles from their mouths. From the mountain top the view is of a low, brushy coast; toward the north, some miles back from the shore, are a few detached brush-covered hills, while here and there the course of intersecting streams and creeks is marked by a line of thicker and darker vegetation.

The Ciénaga swamp thus really divides the island into two unequal parts. It is said to be impassable for horses, but the natives pass through it, at times wading to their armpits in water. At one place there is a causeway, by means of which it is possible to cross on dry land. The Ciénaga is infested with alligators, and mosquitoes are abundant in the rainy season. Large quantities of fish and turtle are caught in the different bays. There are no venomous insects or reptiles on the island.

NUEVA GERONA.

This is the largest town on the island and the capital of the place. It is the residence of the governor, and the garrison, and has a prison for soldiers and civilians sentenced for light crimes. It is a small town of 400 to 500

people, built on the left bank of the Sierra de Casas river, and seems to be very new. The houses are chiefly of stone or rubble, common in Cuba, the streets wide and straight. The banks of the river as far as the boat landing, about a mile and a half up its course, are low and covered with mangroves. Nueva Gerona would seem to be unhealthy on account of its situation. Toward evening the thick vapors rise over the bed of the stream and the mangrove swamps along its banks. Five miles from the mouth of the Santa Fé River on the east coast is situated the town of Santa Fé.

In general the soil of the island is poor, sandy, and in places gritty, with traces of iron; the grass is not generally good, being tough and not nourishing for animals, but it is burnt over in winter. There is little raised, and probably the agricultural possibilities are small. However, a little tobacco is grown, and the cigars are fair, but mild and somewhat flavorless. A few rich spots are found here and there in the stream bottoms, and upon these corn, cane, and vegetables are raised. Probably potatoes would thrive here. Some fruits are grown, which are smaller though of richer flavor than those of other parts of Cuba. This is certainly true of the oranges, which are said by some to be the best in the world. Bananas are cultivated, and many fruits are found growing wild; such as guava, caimito, (a fruit called vegetable brains), papaya, and such mangoes as it would be hard to find elsewhere in the world, whole groves of them, making a mountain of color impossible to describe. The caimito is a small blackish fruit with a large stone, and a pleasant but somewhat sickish taste. The great industry of the island, if anything may be so designated, is the raising of cattle and hogs, but all animals here are small, the largest, it is said, degenerating in size. During the winter, (the dry season), cattle and particularly hogs, become mere bags of bones. These hogs become often quite wild, and are very savage, attacking dogs on sight, and worsting them. Horses are poor weak brutes, living on the coarse grass.

The island has many varieties of wood, such as mahogany, cedar, and hard woods, but the chief growth is the pine. Pines everywhere, but of a heavy kind, full of resin, and even less valuable than the yellow pine of the south. It is hard and difficult to work, and for firewood gives out much smoke and soot; consequently, the people use it little for cooking purposes, preferring hard woods, as the pine flavors the food. In addition to its woods, the resources of the island are its marble quarries and mineral springs. There is some doubt as to the value of the marble, at least of those deposits near Nueva Gerona already worked. It is of irregular hardness, and on account of fissures and veins, only small slabs can be taken out. It is said that beside the white, there is a blue and also a green marble. The medical value of the mineral springs near Santa Fé is acknowledged, and some say that they are the best in the world for all troubles of the stomach. The springs are warm, a little lower than the temperature of the human body; some are impregnated with iron, and others with magnesia. The latter are considered the valuable ones for stomach troubles. At Santa Fé are good baths; the water is tepid and comes from the magnesia springs.

As to health, the island has a high reputation. The inhabitants say that yellow fever is unknown, and the records of the military hospital

show no exemption comparable to this at any other place in Cuba, except at Bahía Honda. Strangers who come here do not have to pass through the term of acclimation usual in Cuba. For consumptives, it is said the place is not so good. The atmosphere seems dryer and more bracing than that of Cuba, especially of the north coast, and it also seems cooler. People here have a good appetite, and altogether, it is said there is not a more healthful spot in this quarter of the globe than the Isle of Pines.

SAILING DIRECTIONS.

The Isle of Pines is of irregular shape, with a deep bay on the western side, sheltered on the SW. by a projecting tongue of land.

Very many water courses and lagoons along the shore are navigable for vessels drawing 7 or 8 feet of water. The island is covered with trees, affording, as its name indicates, pine spars and masts for vessels.

SANTA FÉ RIVER.—This stream is navigable for small vessels of light draft for some miles, and for boats to the village on the right bank. The water is good for drinking. About 3 miles up, a branch turns off to the SW. called the Mal Pais, which is also deep enough for small craft and for boats to a considerable distance. The arm terminates in an extensive lagoon.

EAST COAST.—From the mouth of the Santa Fé the eastern shore bends around to the SE. and south, forming the east side of the island, which is low and swampy. To the eastward of the river the shore is fronted by a chain of low mangrove cays which curve round to the NW. on the north side of the island and terminate at Pipa Cay, about N. 38° E. (N. 34° E. mag.), 18 miles from Barcos Point. Between them and the north shore of the island there is a depth of $2\frac{1}{2}$ and $3\frac{1}{2}$ fathoms, over mud and weed, which may be carried up to Mount Diablo; but thence to the eastward it gradually becomes shoaler, and off the mouth of the Santa Fé there are only 9 feet. The holding ground is excellent; but on account of the bar between the Indian Cays and Frances Point, which is the way in, it is inaccessible to vessels drawing over 16 feet.

Tides.—It is high water, full and change, on the north side of the Isle of Pines, at 6h. 0m., and the rise is 3 feet.

SIGUANEA BAY.—From Bush Cay a ridge of rocks extends off $\frac{1}{4}$ mile to the edge of the bank, and at the same distance NNE. of the cay lies a dangerous patch with only 6 feet water on it. The cay is separated from the point by a small boat channel, carrying 8 feet water, leading into Siguanea Bay. The shore from Frances Point turns abruptly to the SE. for 15 miles, and is skirted by low mangrove cays; it then bends round to the NNE. for 7 miles to a point, forming the inlet, in which there is excellent anchorage for vessels of light draft. A bar, however, about a mile in breadth, runs right across from Frances Point to the south end of the Indian Cays, and has only 16 feet water on it. The depth increases within the bar to $3\frac{1}{2}$ and 6 fathoms, and then gradually decreases toward the shore.

The edge of the bank lies about $1\frac{1}{2}$ miles outside this bar, and is so steep that the first cast near the cays may be 3 fathoms; the depth gradually decreases, and a vessel may work in by the lead and come to in any part of the bight. The deepest part of the bar is about 4 miles SW. of the Indian Cays.

A vessel of light draft may haul into Sigüanea Bay, when about 2 miles to the northward of Frances Point. The depths are 5 and 6 fathoms in the middle of the bight, gradually shoaling toward the shore. There are no dangers, and the holding ground is excellent.

Water.—There is a watering place in Sigüanea Bay, a little to the southward of the Water Hills, the first elevated land from the head of the bight; but the casks must be rolled about 150 yards. There are also two good springs at the foot of the Sigüanea Hills, where water may be obtained at a little distance from the shore.

Tides.—The rise of tide in the bay is about 6 inches, but after a strong norther it is only 3 inches, or less.

INDIAN RIVER.—The entrance to this river lies in N. 7° W. (N. 11° W. mag.), $5\frac{1}{2}$ miles from the eastern point of Sigüanea Bay. Good anchorage, exposed only to the westward, will be found in $2\frac{1}{2}$ fathoms water about a mile off shore.

A mud bar is formed across, making it difficult for even light boats to get in, except at high water; but, having crossed the bar, from 1 to 3 fathoms will be carried for 4 miles up. About $2\frac{1}{2}$ miles within the entrance the mangrove swamps merge into the pine country, and a little higher up, strong and serviceable spars may be cut, of any size under a frigate's topmast, so as to fall into the river. When green they generally sink, but they quickly dry and become much lighter. Pigeons, raccoons, and crocodiles are found in abundance, and great numbers of hogs run wild through the woods.

The coast from the Indian River runs about NNW. 8 miles to Indian Point, which lies N. 41° E. (N. 37° E. mag.) 14 miles from Bush Cay. From Indian Point the shore takes a NNE. direction 9 miles to Barcos Point, the NW. extreme of the island, which is low, and forms the north side of a shallow bay called Barcos Bight. Thence it trends about east $11\frac{1}{2}$ miles to the mouth of the Casas River, which is the loading place of Nueva Gerona, and has the greatest trade with Cuba.

MANGLES ISLES.—This chain of islets and cays, composed of several groups, under the names of Ingleses, Rabihercado, Alcatraces, Pipa, etc., is known as the Mangles Group. They are surrounded by shallow water, which extends some distance from them. From Pipa Cay the islets trend in a SE. by E. direction for about 20 miles, and terminate at the Ingleses Cays, which form the NW. side of the channel of the same name. On the south side of this passage another chain of islets extends to the southward, joining the island near Corral Point, the eastern extreme.

A sand bank surrounds the latter cays at the distance of a mile, connects itself with the great bank eastward of the Isle of Pines, and, trending in that direction 18 miles as far as Tablones Cay, thence runs ESE. 11 miles to Cantiles Cay, on the west side of Rosario Channel. To the north of Cantiles Cay, but on the eastern side of the channel, are the Passage Cays; thence the edge of the Jardines runs northward and NE. to Traviesa and Rabihercado Cays, forming two indentations, separated by the former, and then trending with a southerly curve to the reefs at the NE. extremity of the Jardines, eastward of Diego Perez Cay.

ROSARIO CHANNEL.—Between the west end of Rosario Cay and Cantiles Cay there is a channel through the reefs; but at its inner end, to the westward of the Passage Cays, there are only 9 feet water. The opening

in the reef leading into this channel lies southward of the west end of Rosario, and is $\frac{1}{4}$ mile wide. It is steep at the sides, and in the middle the depth is 3 fathoms; $\frac{1}{4}$ mile from the north point there is a rock which shows above water.

Tides.—The rise of tide in Rosario Channel is about 2 or 3 feet, but the periods are uncertain, and chiefly dependent on the strength of the wind.

DRY SHINGLE.—From the Rosario Channel the edge of the bank runs about SW. for 16 or 18 miles, and just within it a formidable barrier coral reef extends to within 3 or 4 miles of the Dry Shingle, the most southern danger. From the Dry Shingle the bank trends in a NW. and west direction until near the east end of Isle of Pines; but this part of the bank should be approached with very great caution, for although the Caiman fishermen say that it is clear of dangers, its limits are uncertain. On the bank there are numerous small islets, cays, and reefs.

CALAPATCH MEHAGEN REEF is one mass of coral, just awash, and many vessels have been wrecked on it. The reef is in latitude $21^{\circ} 26' 50''$ N., longitude $82^{\circ} 10' 36''$ W. There are soundings about a mile outside the shingle, in from 5 to 14 fathoms.

Caution.—In leaving the Rosario Channel, do not steer to the westward of S. 26° W. (S. 22° W. mag.) until a good offing is gained, especially if the weather be cloudy, and observe that the cays to the westward of Rosario are lower than Largo Cay.

Water.—It is said that good water may be found by digging wells on any of these cays. The fishermen resort to Rosario Cay for this purpose and for the cabbage palm, which grows in great abundance on these islets.

COCOA PLUM CAY lies eastward of the east end of Isle of Pines, and the line of white shallow water between is very distinct. The anchorage under the cay is sheltered by a reef to the eastward, and by the adjacent cays westward. The eye is the guide through the white water, as there are no marks.

THE PETATILLOS are two banks, equal in form and extent, which rise above water and are separated by a passage carrying $2\frac{1}{4}$ fathoms water. Over the greater part the bottom is white, but the lead should be carefully attended. These banks begin about 4 miles southwestward of Culebra Cay and extend 14 miles W. by S., with a breadth of about 2 miles.

LAGUNA AND HAMBRE CAYS.—About 12 miles SW. of Culebra Cay lies the most northern of the Laguna Cays, which, together with those of the Hambre Group, extend about S. by W. 6 miles. This chain of islets is encircled by a reef, which also surrounds the Petatillos and Culebra Cay. Between the Laguna Cays and Petatillos Banks there is said to be a passage with $2\frac{1}{4}$ and $2\frac{3}{4}$ fathoms water, which facilitates the communication with Hacha Channel, and the passage between Cruz and Monterey Cays.

About $4\frac{1}{4}$ miles S. 38° W. (S. 34° W. mag.) of the most southern of the Hambre Cays is Pipa Cay, and the channel between carries about 2 fathoms water.

DIOS CAY.—Nearly 18 miles S. 71° W. (S. 67° W. mag.) of Pipa Cay is Dios Cay, small, low, and surrounded by reefs which extend to the NE. for 10 miles, where there is a channel a mile wide and nearly a fathom deep; thence the reef continues eastward for 8 miles to Pipa Cay, and borders the south side of the Mangles Group at $2\frac{1}{2}$ and 3 miles off, as far as English Channel; on the northern side of the group the reefs are about

a mile off. Between Dios Cay and Carraguco Point is the passage for vessels which trade with Batabano. There are also said to be channels with $2\frac{1}{2}$ and $3\frac{1}{2}$ fathoms water between the Dios and Indian Cays and between the Dios and San Felipe Cays.

INDIAN CAYS form a group 7 miles in extent. They are low, covered with trees, and separated by small channels. The most northern of the group lies about S. 15° W. (S. 11° W. mag.), 13 miles from Dios Cay, and the southern, N. 21° E. (N. 17° E. mag.), $9\frac{1}{2}$ miles from Bush Cay off Frances Point. In the channel, between them and the latter point, there are nearly 3 fathoms water, over mud and weed, which it is said may be carried up to Dios Cay. These cays are surrounded by reefs, which from the south part extend 2 miles to the southward, and from the northern, 2 miles northwestward.

SAN FELIPE CAYS form a chain 13 miles in extent east and west, and are low, marshy, and covered with mangroves. They lie 11 miles southward of Fisga Point. San Felipe Cays, like the former, are bordered by reefs which run northwestward 6 miles to Cucaña Bank, which has 8 feet water on it and lies SW. 13 miles from Fisga Point. Between the reef, extending 5 miles westward of Cucaña Bank, and the coast of Cuba the channel is about 8 miles in breadth and $1\frac{1}{2}$ to $2\frac{1}{2}$ fathoms deep; there is also a one-fathom patch northward of this west extreme of the reef and midway between it and the shore.

The bank between San Felipe Cays and Cape Frances is steep-to, but close within its edge it shoals very quickly, and there are patches of only $1\frac{1}{2}$ fathoms water about 8 miles northeastward of the cape. The bottom is of sand and weeds, but in places not visible. There is a well of good water near the beach, on the south side of the most eastern of San Felipe Cays, and in the vicinity of all of them turtle and fish abound. The west end of San Felipe is reported as being 5 miles westward of the position charted.

Tide.—The rise of tide at San Felipe Cays is about $2\frac{1}{2}$ feet; but it is irregular. The high tide appears to take place in the morning, and the low tide at night. The flood stream runs to NE. with much strength.

II. JUDICIAL DISTRICT OF GUANABACOA.

Population, 32,284.

Townships.	Population.
1. Guanabacoa	
2. Managua	5,964.
3. Regla	10,486.
4. Santa Maria del Rosario	4,966 (4,206 white and 760 colored).

1. AYUNTAMIENTO OF GUANABACOA.

Capital, Guanabacoa.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Bacuranao (Playa de) .	6½	
2. Bacuranao (or Dolores) .	6	
3. Calvo	8	
4. Cojimar	3	
5. Jacominos	3½	
6. Peñalver	5	
7. San Miguel del Padron .	4½	

ROUTES TO GUANABACOA.

1. From Habana, via Jesús del Monte, by macadamized pike.
2. Ferry from Habana to Regla, then by railroad.

GUANABACOA is a city of 28,043 inhabitants, and chief city of the Ayuntamiento. It has a military command, and boards of charity, education, and mutual relief. It has a revenue office, a battalion of volunteers, a battalion of militia and firemen, and a police inspector. It has a small theater and lyceum, a charity hospital, a market place, and two convents, viz, San Francisco and Santo Domingo. Railroad, telegraph station, and post office.

This town, founded in 1555, was originally a village of Indians. Its steeples are in sight of Habana, and it is only three miles from the north coast. It is connected by rail with Regla, and ferry boats cross the harbor to Habana every few minutes. Many officers, clerks, etc., who work daily in Habana, live and sleep in Guanabacoa. Built on the summit and sides of a commanding hill, the town varies in altitude from 130 to 160 feet. The altitude of the public square is 148.6 feet. Owing to its altitude, Guanabacoa enjoys two great advantages; it is well swept by the winds, and its natural drainage is excellent. The sea breeze by day comes from the east, the land breeze by night from the southeast; winds come very rarely from the west; i. e., from Habana. Notwithstanding the excellent drainage, this town is by no means a clean one. Its streets have no sidewalks and no pavements. The houses are dirty and uninviting and the privies are of the Cuban type; i. e., they are buckets, which are emptied at night by a city wagon. The stench this wagon makes in going through the streets might be compared to that from the putrid pits of ancient Rome. The houses are generally small, crowded together, ill ventilated, and uninviting in appearance, and the sanitary conditions are very bad.

Guanabacoa is noted for its numerous springs and wells, and for the excellence and abundance of its drinking water. The soil here differs entirely from that of Habana and Jesús del Monte, which is of limestone coral. Two geological formations characterize Guanabacoa, a volcanic and a sedimentary formation, both Tertiary, and likened by Humboldt to

the Jura formation. The town is situated in the center of a serpentine zone. The waters of its excellent springs and wells contain an abundance of magnesian salts, and also salts of lime and iron. In some springs the water contains an organic aromatic substance, evidently asphaltum, which abounds throughout the serpentine zone. The temperature is lower than that of Habana. The general range of the thermometer annually is from 71.6° to 86° F., the maximum being 89.2° F.

The death rate is about 40. Statistics prove an annual death rate from yellow fever of 10, which is more than would be expected on account of the locality. There can be no doubt that yellow fever is indigenous to this place.

2. AYUNTAMIENTO OF MANAGUA.

Capital, Managua.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Añil	4½	
2. Barreto	3	
3. Canoa	2½	
4. Domingo Pablo	3	
5. Lechuga	1	
6. Nazareno	5	
7. Ojo de Agua	2	
8. Plátano	3½	
9. Ramos	2½	

MANAGUA is a town of 1,000 inhabitants, situated 16 miles from Guanabacoa, at the terminus of the calzada (highway). Stages over this high-road to Habana, which is 12½ miles distant. The nearest railroad station is Calabazar. Post office.

3. AYUNTAMIENTO OF REGLA.

REGLA is a seaport town, situated 2 miles from Guanabacoa on Habana Bay. This town may be considered part of Habana, its trade being so closely connected with that of the capital. Steamers leave every half hour for Habana. It has warehouses, docks and ship yards. Board of education, health, charity, agriculture, industry, and commerce. It has an arena, post office, telegraph station, tramway to Guanabacoa, and railroad to Matanzas.

The town is located on the eastern shore of the harbor, and directly opposite to the central part of the city of Habana. The intervening harbor is at this point three-fifths of a mile wide, and is traversed every few minutes by ferryboats. While all the western shore of the harbor, as also a part of the northern seashore, is occupied by Habana, the more extensive eastern shore of the harbor is occupied by the two settlements, Casa Blanca and Regla. These are separated by the bay of Marimelena, about three-fifths of a mile wide. The coast section of Casa Blanca is one of the wards of Habana, as Regla was for a long time. However, for several

years past Regla has been separated from Habana. The natural drainage of Regla is good, but art has aided nature very little. The town has a dilapidated, uncared-for, and filthy appearance. It is built upon a tongue of land projecting between the coves of Marimelena and Guanabacoa, and is very near to the mangrove marshes, which are very extensive around the bay of Marimelena. Hence Regla is much exposed to malaria. The depot for ballast at Regla is much used, but said to furnish the most unsanitary ballast of any of the depots located along the east shore of the harbor of Habana. The death rate is from 40 to 50. See also chapter on "Environs of Habana" (page 103).

4. AYUNTAMIENTO OF SANTA MARÍA DEL ROSARIO.

Capital, Santa María del Rosario.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Capote	2½	837 inhabitants (523 white and 314 colored). 9½ miles from Habana.
2. Cotorro (El)	1	
3. Grillo	2½	

ROUTES TO SANTA MARÍA DEL ROSARIO.

1. From Habana by rail to Guanabacoa, thence by road.
2. By Habana, Güines pike, which runs about a mile from the town.

SANTA MARÍA DEL ROSARIO is a city of 710 inhabitants (610 white and 100 colored), situated 5½ miles from Guanabacoa. It is 8 miles southeast of Habana, and about a mile from the calzada (highway), between Habana and Güines. It has springs of mineral water, and a mine of coal and asphalt. The nearest station is Guanabacoa. Post office.

III. JUDICIAL DISTRICT OF GÜINES.

Population, 79,000; area, 1,079 square miles.

Townships.	Population.
1. Catalina	8,956 (4,509 white; 4,447 colored).
2. Guara	
3. Güines (San Julian de los)	12,401.
4. Madruga	5,275 (3,658 white; 1,617 colored).
5. Melena del Sur	
6. Nueva Paz	9,571.
7. Pipian	6,000.
8. San Nicolas	6,680.

1. AYUNTAMIENTO OF CATALINA.

CATALINA is a town of 3,142 inhabitants, situated $7\frac{1}{2}$ miles from Güines and 44 miles from Habana. Boards of public education, health, and assessments. Post office, railroad, and telegraph station.

2. AYUNTAMIENTO OF GUARA.

GUARA is a town of 5,250 inhabitants, situated $12\frac{1}{2}$ miles from Güines. A fair is held here on June 12th. Habana railroad and post office.

3. AYUNTAMIENTO OF GÜINES (SAN JULIAN DE LOS).

Capital, Güines.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Candela	3	
2. Guanajo	3	

ROUTES TO GÜINES.

1. From Habana by United Railways.
2. By pike.

GÜINES is a town of 6,828 inhabitants; chief commercial city; 30 miles from Habana by highroad and 45 miles by rail. It is situated on a plain on the banks of the river Mayabeque. The surrounding country is generally open and level, but there are hills far away to the north and west and a low distant ridge to the south. This city is traversed by the river Catalina, over which are built ten stone bridges. It has a military command. It has a board of agriculture. The jurisdiction of Güines is quite rich in sugar plantations and stock-raising farms, the best horses in Cuba coming from this region. It has also boards of industry, commerce, and charity; a civil hospital, casino, and Spanish club, post office and telegraph station. This town has one of the best railway stations in Cuba. Central railway to Habana, Matanzas, and Cardenas.

Yellow fever is not indigenous to Güines, but imported. Whenever troops have been sent here yellow fever has prevailed, especially from June to September; then the air is loaded with vapor and the thermometer is above 72° F. However, yellow fever does not habitually prevail here. Some years there has not been a single case. Frost has never occurred but once.

4. AYUNTAMIENTO OF MADRUGA.

Capital, Madruga.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Concordia		
2. Corral		
3. Cayajabos	6	
4. Itabo	4	
5. Purial		
6. Sabana		
7. Sabana-Roble	8	
8. San Blas	3½	
9. Zaldivar		

ROUTE TO MADRUGA.

From Habana to Güines by United Railways and then by branch road.

MADRUGA is a town of 1,000 inhabitants, situated 52 miles from Habana. It has a board of education, post office, and telegraph station.

Madruga is a watering place, the season lasting from March to October. During that time there are several hotels open. It has sulphur springs, and other waters good for indigestion; also good baths. It is a pleasant, "sleepy" place, with high hills, and a beautiful valley dotted with palms and covered with cane. The town is old, built of stone, with some of the smaller houses of wood. The business is chiefly the cultivation and shipment of rice and cane. Little or no tobacco is seen in this region. It has the usual red soil, favorable for the cultivation of sugar. The place would probably be excellent as a sanitary camp, and a force here could readily protect itself. There is a warehouse for cane and molasses and also a loading platform. The chief vehicle used here is the great two-wheeled sugar cart, drawn by oxen.

5. AYUNTAMIENTO OF MELENA DEL SUR.

MELENA DEL SUR is a town of 1,082 inhabitants (675 white and 407 colored), situated 7½ miles from Güines. It is the capital of the ayuntamiento. It grows sugar cane and raises stock. It has a post office. Habana Railroad to Matanzas.

6. AYUNTAMIENTO OF NUEVA PAZ.

Capital, Nueva Paz.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Bagaes	3½	2,239 inhabitants.
2. Principe Alfonso	3	2,110 inhabitants.
3. Vegas	6	2,485 inhabitants.

NUEVA PAZ is a city of 2,737 inhabitants, situated 21 miles from Güines and 8 miles from the southern shore. Produces sugar cane. The nearest station is Palos, 3 miles distant. Post office.

7. AYUNTAMIENTO OF PIPIAN.

Capital, Pipian.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Jobo	5	
2. Naranjito	2	
3. Ojo de Agua.....	2	

PIPIAN is a town of 1,079 inhabitants, situated $13\frac{1}{2}$ miles from Güines. The nearest station is Madruga, $3\frac{1}{2}$ miles distant. It has a post office.

8. AYUNTAMIENTO OF SAN NICOLAS.

Capital, San Nicolas.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Caimito	6	

SAN NICOLAS is a town of 1,500 inhabitants, situated $8\frac{1}{2}$ miles from Güines. Villanueva railroad to Union de Reyes. It has a post office and 10 sugar works.

IV. JUDICIAL DISTRICT OF HABANA.

Has only one township, as follows:

1. AYUNTAMIENTO OF HABANA.

Capital, Habana.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Almendares (Puente de).	-----	
2. Arroyo Apolo.....	3 $\frac{1}{4}$	
3. Arroyo Naranjo.....	6 $\frac{1}{4}$	
4. Calvario.....	6 $\frac{1}{4}$	
5. Santa-Rana.....	6 $\frac{1}{4}$	
6. Carmelo (El).....	2 $\frac{1}{4}$	
7. Casa Blanca.....	1 $\frac{1}{4}$	
8. Ciénaga (La).....	2 $\frac{1}{4}$	
9. Chorrera (La).....	4	
10. Jesús del Monte.....	3	
11. Luyano.....	4	
12. Mantilla.....	5 $\frac{1}{2}$	
13. Mordazo.....	3 $\frac{1}{4}$	
14. Pescante (El).....	-----	
15. Pueblo Nuevo.....	1	
16. Pueblo Nuevo de Peñalver.	-----	
17. Puente (El).....	3 $\frac{1}{4}$	
18. Puentes Grandes.....	4 $\frac{1}{4}$	
19. Quemados (Los).....	6 $\frac{1}{4}$	
20. Requena.....	-----	
21. San Augustin.....	5	
22. San Antonio Chiquito.....	-----	
23. San Juan.....	13 $\frac{1}{4}$	
24. Seiba del Quemado.....	5	
25. Vedado (El).....	3	
26. Víbora.....	3 $\frac{1}{4}$	

HABANA is the capital of the island and of the province of the same name, 200,448 inhabitants. (For description, see page 41.)

ARROYO NARANJO is a town of 3,000 inhabitants, situated 7 miles south of Habana on the calzada (highway) to Santiago. It has one long street, lined with fairly good houses.

COJIMAR (HABANA) is a suburb of Habana on the north coast. (For description, see chapter on "The Environs of Habana.")

EL CERRO (HABANA) is a residence suburb of Habana. (For description, see chapter on "The Environs of Habana.")

LA CIÉNAGA (HABANA).—(For description of this town, see chapter on "The Environs of Habana.")

PUNTES GRANDES.—(For description of this town, see chapter on "The Environs of Habana.")

TULIPAN.—(For description of this town, see chapter on "The Environs of Habana.")

V. JUDICIAL DISTRICT OF JARUCO.

Population, 12,584; area, 635 square miles.

Townships.	Population.
1. Aguacate	4,028.
2. Bainoa	3,500 (3,000 white; 500 colored).
3. Casiguas	3,890 (3,047 white; 843 colored).
4. Jaruco	12,584.
5. Jibacoa	3,966 (2,695 white; 1,271 colored).
6. San Antonio de Rio Blanco del Norte.	5,800 (3,500 white; 1,300 colored).
7. San José de las Lajas	7,000 (4,600 white; 2,400 colored).
8. Tapaste	6,125 (5,311 white; 814 colored).

1. AYUNTAMIENTO OF AGUACATE.

Capital, Aguacate.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Compostizo	2	
2. Reloj	4	
3. Zabaleta	6½	

ROUTES TO AGUACATE.

1. From Habana by United Railroads.
2. From Matanzas by pike or rail.

AGUACATE is a town of 1,427 inhabitants, situated 13½ miles from Jaruco. Regla railroad to Matanzas and Bemba. There is a highroad to Matanzas. Post office.

2. AYUNTAMIENTO OF BAINOA.

Capital, Bainoa.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Santa Cruz	6	

BAINOA is a town of 1,000 inhabitants (800 white and 200 colored), situated 7½ miles from Jaruco. Habana Bay Railroad. Post office.

3. AYUNTAMIENTO OF CASIGUAS.

CASIGUAS is a town of 214 inhabitants (126 white and 88 colored), situated $5\frac{1}{4}$ miles from Jaruco, which is the nearest station. Post office and telegraph station.

4. AYUNTAMIENTO OF JARUCO.

Capital, Jaruco.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Arroyo Vuelto	-----	
2. Boca de Guanabo	14	
3. Boca de Jaruco	$10\frac{1}{4}$	
4. Castilla	7	
5. Cruz del Padre	8	
6. Escalera	-----	
7. Garro	2	
8. Guaicanamar	$2\frac{1}{2}$	
9. Guanabo	13	
10. Justiz	-----	
11. Loma Blanca	10	
12. Peñas Altas	10	
13. Perú	4	
14. Puente	-----	
15. Rincón	14	
16. Santa Ana	9	
17. Santa Bárbara	-----	
18. Tablas	-----	
19. Trinidad	9	

ROUTE TO JARUCO.

From Habana by United Railways.

JARUCO, capital of the ayuntamiento and judicial district of the same name, is a city of 2,165 inhabitants, situated $23\frac{1}{4}$ miles from Habana, about 8 miles from the north coast. It has a military command, board of education, board of health, board of charity, civil and military hospital, post office, and telegraph station. Habana Railroad to Matanzas.

This town was founded about 1770. The population is mostly white. The country about is mountainous, and the town comparatively healthy and clean. It has no fetid wells, water being brought in kegs.

It is said that the natives here suffer from bilious remittent fever, which is essentially yellow fever. However, the disease never has been known to be very severe.

LA BOCA.—This town of 200 inhabitants is 9 miles north of Jaruco, on northern coast, at mouth of Jaruco River. It has one long street. The houses are of rubble. No communication with interior, except by one difficult trail across the hills. The harbor affords fair shelter to vessels of light draft.

LOS ALMACENES DE JARUCO (The "Warehouses of Jaruco") is the port of Jaruco. It is 3 miles from the mouth of the river, and there is no practicable road to this mouth. A miserable village of a few dozen houses of rubble and some palm huts.

RINCÓN.—This town is 15 miles from the heart of the city of Habana, and has lines of communication by road and rail to Batabanó, Guanajay, Mariel, Cabañas, Bahía Honda, and Artemisa. There are two railroads and one turnpike from Rincón to Habana; one of them, the Habana Railroad, having a double track to La Ciénaga. This railroad runs on the west side of the valley south of Habana Bay, passes close to the Vento Reservoir, crosses the Almendares River on an iron bridge some 60 feet long, runs close to strong, defensive position near Puentes Grandes; and from La Ciénaga straight toward El Principe, about 2 miles distant, is exposed to fire from that work, also from the heights near the Almendares, from the hill of the Jesuits, and partly from the Cerro. The Western Railroad and the turnpike entering Habana at Jesús del Monte present another line of advance from Rincón to Habana. The railroad bridge at Calabazar, over the Almendares River, is a large structure that could be easily destroyed. Infantry can probably ford the Almendares River, at most times, between December and May. The rail lines from Rincón extend west to Guanajay, southwest to Pinar del Río, south of Batabanó (via San Felipe), east to Güines (and other points), and north by two routes to Habana. The country roads of this part of Cuba are generally good in the dry season, i. e., from December to May, and a fine turnpike runs through Rincón from Bejucal to Habana. Thus a large tract of fertile, well cultivated country is tapped by roads and railroads meeting at Rincón.

5. AYUNTAMIENTO OF JIBACOA.

JIBACOA is a town of 696 inhabitants (593 white and 103 colored), situated 12½ miles from Jaruco, 31 from Habana, and 2½ from the port of Santa Cruz. Post office.

6. AYUNTAMIENTO OF SAN ANTONIO DE RÍO BLANCO DEL NORTE.

Capital, San Antonio de Río Blanco del Norte.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. San Matías de Río Blanco.	6	Port of 460 inhabitants, fitted out for coasting trade. It is on the Jaruco River 2 miles from the northern coast and 23 miles east of Habana. Post office.

SAN ANTONIO DEL RÍO BLANCO DEL NORTE is a town of 1,200 inhabitants, situated 4½ miles from Jaruco, 25 miles from Habana, and 6 miles from the northern coast. It is on the old road to Habana. The climate is healthful and dry. Post office.

7. AYUNTAMIENTO OF SAN JOSÉ DE LAS LAJAS.

Capital, San José de las Lajas.

Outlying villages.	Distance from capital.	Remarks.
1. Jamaica	Miles. 2	

SAN JOSÉ DE LAS LAJAS is a town of 2,170 inhabitants (1,800 white and 370 colored), situated $12\frac{1}{2}$ miles from Jaruco and $17\frac{1}{2}$ miles from Habana, on the southern slope of the Camoa hills. It is the capital of the ayuntamiento. It is located about 15 miles from the northern and 20 miles from the southern seacoast. It is encompassed by coffee plantations and stock-raising farms. It has a board of health, a board of education, a theater, and a post office.

This town, founded in 1778 or 1785, has a general reputation for health and for its exemption from yellow fever. It is located on the turnpike to Güines, which is probably the best road in Cuba, and goes through the most picturesque country in the vicinity of Habana. There is a daily stage between Habana and San José. The town is built on a plain from 300 to 350 feet above the sea, but this plain has slight irregular depressions forming brooks, ponds, and swamps, all stagnant except in the rainy season. Malaria so prevails here that besides complicating nearly every disease, probably half of all cases are due solely and directly to this poison. The town occupies about 170 acres; the houses are unattractive and closely aggregated, many of them being mere palm leaf huts with dirt floors.

The death rate is about 30. The unacclimated population numbers about 100, and of these 10 or 12 are attacked annually with yellow fever.

8. AYUNTAMIENTO OF TAPASTE.

TAPASTE is a town of 1,136 inhabitants (882 white and 254 colored) situated on the central highroad of the island $8\frac{1}{2}$ miles from Jaruco. It is a much frequented point. Post office.

VI. JUDICIAL DISTRICT OF MARIANAO.

Population, 7,352.

Township.	Population.
Marianao	7,352

1. AYUNTAMIENTO OF MARIANAO.

Capital, Marianao.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Cocosolo		
2. Lisa (La)	$\frac{1}{2}$	
3. Playa de Marianao	$1\frac{1}{2}$	
4. Pocito	$\frac{1}{2}$	
5. Quemados	$\frac{1}{2}$	

ROUTES TO MARIANAO.

1. From Habana by suburban railway.
2. From Habana by pike.

MARIANAO is a city, capital of the judicial district of the same name, situated 7 miles from Habana. Asylum for children, railroad, and post office.

Marianao includes the settlements of Marianao proper, of Quemados, on the same ridge and a half mile nearer to Habana, of the playa or beach, a very small sea-bathing resort; and in addition the country houses adjacent to these settlements. It is a popular summer resort, and enjoys great reputation for general healthfulness, and especially for its exemption from yellow fever. Marianao is located on a ridge which runs northeast to Habana, and is elevated 140 to 160 feet above the sea, which can be seen beyond an intervening green slope some 2 miles in width. It is the cleanest, most attractive, and the most beautiful town in Cuba. The natural drainage is unusually excellent. The foundation rocks are limestone, which frequently crop out on the surface and are very seldom covered by more than 3 feet of superficial soil. Some houses have their own supply of water from wells from 20 to 60 feet deep, but a large part of the population is supplied with water in kegs and carboys, brought from what is said to be a most abundant and excellent spring. This spring is about one-eighth of a mile from the settlement of Marianao, down a steep hill, and on the bank of the insignificant river of Marianao to the west of the town. The streets, though unpaved, are wide and good. The houses have ample space, are not crowded together, and are much better ventilated than those of Habana. The commanding position of Marianao insures its being well swept by the strong sea breezes which naturally prevail. Many houses here have their floors elevated from 1 to 5 feet above the ground. As elsewhere in Cuba, the floors are of brick, stone, marble, plank, and some of earth, the last being common among the poor. The natives who live on the heights are little troubled with malaria. However, the summer residents who occupy these heights sometimes suffer very much.

The death rate for 1878 was 40, a very high one for a town said to be so healthful. Although some of the most interested inhabitants, hotel keepers, and the like, swear that yellow fever has not been known in Marianao,

yet it appears to have cropped out, especially from 1853 to 1868. However, this city presents an example of a high, dry, well-ventilated place, fully exposed to the trade winds, within 7 miles of Habana, and practically free from yellow fever poison.

(See also "La Playa de Marianao," under the "Environs of Habana.")

VII. JUDICIAL DISTRICT OF SAN ANTONIO DE LOS BAÑOS.

Population, 30,026.

Townships.	Population.
1. Alquizar	8,709
2. Ceiba del Agua	
3. Guira de Melena	9,500
4. San Antonio de los Baños	7,500
5. Vereda Nueva	4,000

1. AYUNTAMIENTO OF ALQUIZAR.

Capital, Alquizar.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Guaibacoa	4	
2. Guanamar	8	

ALQUIZAR is a town of 2,700 inhabitants, situated $8\frac{1}{2}$ miles from San Antonio de los Baños, and about 6 miles from the boundary of Pinar del Río Province. It has a post office and a telegraph station. Habana Railroad to Pinar del Río. It is in a low, flat tract, with brush and trees, but this is, nevertheless, a rich and cultivated country. There is much sugar in the vicinity. The people seem to be prosperous and active, about half negroes and half whites. Water is obtained from wells and cisterns, so that the place is probably more or less healthful. There is a barracks here for volunteers. The houses are composed of stone, brick, and stucco, generally one-story high. The streets are all paved. It is without defense and there are no strong positions in the surrounding country.

2. AYUNTAMIENTO OF CEIBA DEL AGUA.

Capital, Ceiba del Agua.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Capellanías	2	450 inhabitants.
2. Chicharron	3	
3. Palma Picada	$\frac{1}{2}$	
4. Palomino	$\frac{1}{2}$	
5. Paz (La)	4	
6. Virtudes (Las)	$3\frac{1}{2}$	

CEIBA DEL AGUA is a town of 2,950 inhabitants, situated 10 miles from San Antonio de los Baños, near the boundary of Pinar del Río Province. Habana Railroad to Guanajay. Post office.

3. AYUNTAMIENTO OF GUIRA DE MELENA.

Capital, Guira de Melena.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Cachimba	$2\frac{1}{2}$	
2. Gabriel	5	
3. Guayabo	$2\frac{1}{2}$	
4. Leal	$3\frac{1}{2}$	
5. Tamaulipas	5	
6. Tumbadero	5	

GUIRA DE MELENA is a city of 3,500 inhabitants, situated 8 miles from San Antonio de los Baños and 29 miles from Habana. It is in a healthful locality. It has a board of education, board of charity, and mutual aid societies. Telegraph station and Western Railroad.

GABRIEL is 23 miles south of Habana, on railroad to Pinar del Río, in a highly cultivated, level country. It is a small place, lying on both sides of the track of the railroad, and numbers from 500 to 1,000 inhabitants.

LA PLAYA DE GUANIMAS is a small fishing village of 300 to 400 inhabitants, on southern coast. It is a poor harbor.

4. AYUNTAMIENTO OF SAN ANTONIO DE LOS BAÑOS.

Capital, San Antonio de los Baños.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Armonía	3	
2. Chicharro	5	
3. Govea	6½	
4. Monjas (Las)	2	
5. Quemadas (Las)	4	
6. Quintana	1½	
7. Santa Rosa	5½	
8. Seborucal	5½	
9. Tumbadero	7	
10. Valle	1½	

ROUTE TO SAN ANTONIO DE LOS BAÑOS.

From Habana by United Railways, via Rincón.

SAN ANTONIO DE LOS BAÑOS is a town of 7,500 inhabitants, capital of the judicial district, situated 21 miles from Habana, about midway between the northern and southern coast. The baths are much frequented, because the town is healthful and picturesque. There is a military command here. Post office and telegraph station. It is on the railroad from Habana to Guanajay.

The town is on high ground, which is the watershed for both the north and the south coast. It has good houses of stone and rubble, surrounded by a level, brush-covered region. Roads good in dry season. The Ari-guanabo River waters this locality, permeates the soil in all directions, and keeps the climate very humid. Death rate from 35 to 60. The mayor's report states that "though fatal cases of yellow fever have occurred here since 1854, these have always occurred among Spaniards."

5. AYUNTAMIENTO OF VEREDA NUEVA.

VEREDA NUEVA is a town situated 6 miles from San Antonio de los Baños and 26½ from Habana. It was founded in 1881. The ground is level and fertile. It has a board of health, board of education, and a board of assessments. It has a telephone line which connects it with the out-lying towns. The nearest station is Seborucal, 2 miles away. Post office.

PROVINCE OF MATANZAS.

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ALFONSO XII.

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PROVINCE OF MATANZAS.

LOCATION AND BOUNDARY.

The Province of Matanzas is situated in the west central part of the Island of Cuba. Its northern part is in the most fertile and productive zone of the island and is noted for its picturesque landscape. Its southern part is composed of a large swamp called Gran Ciénaga Occidental de Zapata. This swamp is on both sides of the river Hatiguanico or Gonzalo, the upper portion extending 10 miles inland in the Province of Matanzas and the lower portion extending 5 miles inland in the Province of Santa Clara.

On the north it is bounded by the Straits of Florida, on the east and south by the Province of Santa Clara, and on the west by the Gulf of Matanó and the Province of Habana.

AREA AND POPULATION.

Area, 4,175 square miles.

Population, 250,752. There are 4 judicial districts (*partidos judiciales*) and 24 townships (*ayuntamientos*). These divisions comprise 2 cities, 3 towns, 25 villages, 40 hamlets and suburbs, and 15,200 estates.

ADMINISTRATION.

Matanzas is a third-class province with regional governorship, a military command, with an administration of roads and communications and of finance, with a president, vice-president and secretary, and 13 deputies representing the 4 judicial districts, a provincial deputation, 23 *alcaldes municipales* (*mayors*), 4 vicars, and 25 parishes. It has a territorial criminal court with 5 courts of the first instance or inquiry, and 26 municipal courts. There is a harbor captaincy and a naval adjutancy. The courts of the first instance are as follows: The north court, the south courts, that of Alfonso XIII, Cárdenas, and Colon. The municipal courts are: Matanzas, Santa Ana, Parissi, Guamacaro, Alfonso XIII, Caberas, Bolondron, Unión de Reyes, Sabanilla del Comendador, Cárdenas,

Cimarrones, Guanajaybo, Guamutas, Lagunillas, Colón, Jovellanos, Macuriges, Macagua, Carantes, Roque, San José de las Ramos, Cuevitas, and Palmillas.

PUBLIC INSTRUCTION.

The provincial collegiate institute numbers 268 students. There are first and second class colleges, located principally in the city of Matanzas. There are 150 municipal schools numbering 5,327 students, and 116 private schools. In the city of Matanzas there are also institutes of science, art, and literature. There is a board of public instruction at Cárdenas.

AGRICULTURE, INDUSTRY, AND COMMERCE.

AGRICULTURE.—Matanzas is one of the richest and most developed portions of the island. Its products are corn, rice, sugar cane, fruits, honey, and wax, some tobacco, considerable cotton, and timber for building and cabinet work.

It is the most advanced province in the use of machinery and implements of labor.

INDUSTRIES are the raising of sugar and tobacco and distilling liquor; the mining of copper, some gold and silver, rock salt, and pit coal. There are cattle farms, lime kilns, and distilleries; but the most important branch is the raising of sugar, Cárdenas having the greatest number of sugar plantations of any of the judicial districts of the island, and Colon the next greatest number.

COMMERCE.—The commerce is extensive and favored by the harbors, rivers, and railways. Sugar is the chief article of export. The city of Matanzas, the capital of the province, is the second commercial city in the island.

GEOGRAPHY AND TOPOGRAPHY.

The territory of the province is divided into four judicial districts, of which Matanzas is the largest. The province has an area of 1,687 square miles, the width between extreme points north and south being 60 miles and the length between its extreme points east and west being 95 miles. It is situated in the northwestern part of the island.

CITIES AND TOWNS.—The largest and most important of its towns are Matanzas, population 50,000; situated on the Bay of Matanzas, on the north coast, in the western part of the province; and Cárdenas.

LAKES.—There are a number of small lakes in this province, the principal ones being Charco, Albufera, Guanamon, Guanajayabo, Pesaro, Carmacho, Puerto Rico, Choco, Corral Nuevo, Tucaro, San Blas, Macurajas, Masio, Carbillas, Grande, and Las Obas.

CREEKS.—The creek of Cárdenas in the north and that of Broa in the south.

CANALS.—On the northern coast are found the following canals: Pluma, Manui, Genoves, Tarrenteras de Galindo, Barcos, Pargo, San Mateo, and Nicolas Sanchez.

TOPOGRAPHY.—On the northern coast skirting the Matanzas Bay are highlands, the highest point being 1,300 feet above the sea level. This point is called Pan de Matanzas, so named from its resemblance to a loaf of sugar. The Pan has had great celebrity among the navigators, as from it they have long been accustomed to get their bearings off a dangerous coast, none too well marked by artificial aids to navigation.

The central one of the three orographic groups of mountains of the island is partly in the province of Matanzas and partly in that of Santa Clara. The land slopes to the south coast in the western part of the province. On the southern coast, on the north bank of the river Hatiguanico, is the greater half of an immense swamp, called Gran Ciénaga Occidental de Zapata. This swamp played a conspicuous part in the late Cuban war. The insurrectionists, knowing its intricacies, carried their wounded there. The moment they touched the borders of this swamp they were in a place of safety, as the Spaniards, being unfamiliar with it, were afraid to expose themselves to its dangers. The earth has undergone several great revolutions, and one of them is marked by the caverns of Matanzas. There are the magnificent caves of Bellamar, with fine crystallizations, the admiration of all strangers. They are located $3\frac{1}{2}$ miles from the city of Matanzas and open upon the Bay of Matanzas. The harbor front is low, but the land rises from thence inland to the level of 100 feet above the level of the sea.

In the extreme northwest is the rocky range of Sierra de Camarones and the Arcos de Diego, Hato Nuevo de Santa Clara in the northeastern part, and in various parts of this central group or district of mountain ranges are to be found many hills and elevations, among which are the group of

Habana, Tetas de Camarioca Palengue, Cumbre, Carbas, Leinones, Santa Ana, Gonzales, Triana, Cimarrones, and las Guimbambas.

PLAINS.—There is a large plain extending from Cárdenas to Holguin, broken by groups of mountains and their slopes, but the general elevation of the plain is not great, and if a subsidence of a few hundred feet were to take place, everything would disappear beneath the waves of the Atlantic except the portion of the mountain groups which forms its backbone.

VALLEY.—The tropical valley of the Yumuri is one of surpassing natural beauty.

MARSHES.—There are the marshes of Majaguillal, Yumuri, and Zapata. The marshes Ilicacos and Choco are salt. Choco yields annually many hundred tons of salt.

RIVERS.

In Matanzas the principal rivers flow to the south, the height of the land being near the northern shore. The principal rivers are:

Negro and Gonzalo, on the southern boundary of the province, flow west and join, forming the river Hatiguanico, which empties into the Ensenada de la Broa. This river flows through the swamp Ciénaga Occidental de Zapata and forms the boundary line between Santa Clara and Matanzas on the south.

Amarillas rises in the east center portion of the province, flows southwest, forming the boundary between Matanzas and Santa Clara provinces, and empties in the Lake of Tesoro.

Palma rises in the east central portion of the province, flows north and empties into the Bay of Santa Clara.

Sagua rises in the Sierra de Gonzalo, flows north and empties into the bay of Cárdenas.

Camarioca rises in the Sierra de Gonzalo, flows north and empties into the ocean west of Icacos Peninsula.

Bacunayagua and Escondido rise in the Group of Habana, flow north and empty into the Florida Canal west of Matanzas Bay.

Yumuri and San Juan Rivers empty into the Bay of Matanzas, flowing through the city of Matanzas, and by the deposits of the sand and mud which their waters bring down form shoals and banks which narrow the limit and depth of the anchorage.

A shallow mud flat runs off in front of the city, preventing vessels from coming nearer to the wharf than $\frac{1}{2}$ mile.

The Jatibonico empties into the Broa inlet; defines part of the boundary between Matanzas and Santa Clara provinces. The Yumuri, the San Juan, and the Canimar are navigable for a short distance and empty into Matanzas Bay.

COAST LINE OF MATANZAS.

On the northern coast are the highlands skirting Matanzas Bay, indented by the bays of Matanzas, Cárdenas, and Maya. There is a breakwater from Cape Hicacos (Cárdenas) to Nuevitas, the reefs, keys, and banks of which are known as the Sabana Camaguey. The coast line of this province extends only along its northern boundary, the other boundaries being either land or rivers.

REEFS, BANKS, CAYS, AND SHOALS.

The principal reefs, banks, cays, and shoals of this province are:

Cabezas Cay, 7 miles westward of Bahía de Cadiz, has a dangerous ledge running from it to the westward, and, as it lies on the edge of bank, it should be approached with great caution. About midway between this cay and Bahía de Cadiz is a shoal, on which the sea does not always break. From the Cabezas Cay the edge of the bank takes a W. $\frac{1}{2}$ N. direction for 17 miles to the north end of Cruz del Padre Cay, which is the northernmost of the whole range. Thence the bank sweeps around to the SW., forming a convex to the westward, and terminates off the west part of Icacos Point.

CRUZ DEL PADRE AND GALINDO CAYS.—Five miles WSW. of Cabezas Cay is the Pargo Channel, and 3 miles farther westward is that of Barcos, formed between the reefs; hence several cays continue to the WNW. as far as Galindo, on the north side of which are two small cays, Galindito and Muela. From Galindo, other cays continue to Cruz del Padre. About a mile N. 11° E. (N. 8° E. mag.) of Muela is a shoal near the edge of the bank; and a mile northward of Cruz del Padre Cay a chain of reefs commences and extends 6 miles westward.

Water.—On these cays, particularly at Cruz del Padre and Galindo, there are wells of good water.

Light.—On the reef about $\frac{3}{4}$ mile NE. of Cruz del Padre Cay is a conical white tower, from which is shown, 49 feet above the sea, a fixed white light, visible 10 miles. This light is not to be depended on.

Blanco, Mono, Piedras, and Monito Cays, the westernmost of the cays and islets skirting the north coast of Cuba, lie about a mile from the edge of the bank. About 5 miles SW. of Cruz del Padre is a group of low cays, extending NE. and SW., named Blanco. To the southward of them there is anchorage for vessels of 11 feet draft, with good shelter.

Mono Cay lies about 5 miles WNW. of the Blanco Group, and from it a shallow ledge runs off to the NE. a full $\frac{1}{4}$ mile; and a mile from the cay in the same direction there is a dangerous shoal (Palas Rock) of $1\frac{1}{2}$ fathoms water. Piedras Cay, composed of rock and sand, partly covered with low bushes and about 600 yards in extent, lies 2 miles SW. of the latter. Close off its NW. side are three rocks above water. A shoal of 16 feet water extends 550 yards NE. from the north point of this cay, and a coral patch of 15 feet is situated one mile from the same point and in the same direction; depths of $5\frac{1}{2}$ fathoms were found between these shoals.

There is no discoloration of the water on this patch, but the sea breaks in heavy weather. There are from 5 to 8 fathoms water on either side of the shoal to within 600 yards of the cays. Monito Cay, $1\frac{1}{2}$ miles from Piedras Cay, is a small black rock scarcely above the sea; a reef extends around it for about 400 yards. The channel between Piedras and Monito is clear. The soundings decrease as it is approached, and in the middle the depth is 6 fathoms. To sail through this channel a vessel should be able to lay up ESE. There is also a channel southward of Monito, but it is not recommended.

Light.—On Piedras Cay is an iron tower above a house, from which is shown, 75 feet above the sea, a fixed white light, varied by a red flash every two minutes, and visible 14 miles.

Anchorage.—There is good anchorage within the cays, in 6 fathoms water, sandy bottom, with Piedras Cay bearing west (S. 87° W. mag.) and Mono Cay from north to NNW.; or in 4 fathoms, to the southward of Piedras Cay.

Tides.—It is high water, full and change, at Piedras Cay at 8h. 0m., and the rise is about $2\frac{1}{2}$ feet.

Cayo Corojal is a cay in the midst of a swamp on the north-eastern coast.

PIEDRAS REEF AND CAY.—From Padre Point, which is low, a coral reef extends SE. for nearly 7 miles, where it terminates at Piedras Cay, which is small and low. The reef is steep-to and has several narrow cuts leading upon the bank, through which 15 to 22 feet may be carried. The best channel is just to the northward of the cay, but as nothing would be gained it will be better always to pass outside the cay. The edge of the bank takes a W. $\frac{1}{4}$ N. direction, and 13 miles from the cay is Las Lavandéras shoal, which is 2 miles in length, and lies $1\frac{1}{2}$ miles southward of the east end of Blanco Cay.

The shore from Padre Point westward as far as Cristobal Point, a distance of 35 miles, is very low, swampy, and skirted by numerous mangrove cays. Blanco Cay, the largest of these, is 10 miles long ESE. and WNW., and its west end is 15 miles from Padre Point. The south shore of this cay is of sand, and at the east end water may be obtained by digging wells.

Light.—On the northern part of Piedras Cay a fixed white light is exhibited from above the keeper's dwelling, which is brown. It is 28 feet above the sea, and may be seen in clear weather 9 miles.

Shoals.—A shoal lies in the fairway of the entrance to Cárdenas Bay, on which a vessel grounded in 14 feet of water. The shoal lies on the following bearings: Piedras Cay light-house N. 59° W. (N. 62° W. mag.); Mono Cay, left tangent, N. 14° W. (N. 17° W. mag.); Nordeste Point N. 62° E. (N. 59° E. mag.).

About 200 feet from the vessel, on every side, $3\frac{1}{2}$ to $4\frac{1}{2}$ fathoms of water were found, as indicated on the charts.

The shoal of Memlo is north of the peninsula of Hicaco and that of Buba or del Mangle off to the east. There is a shoal a little east of the same peninsula of considerable size. The shoals of Romero, Macho, and Machilo are just outside or partly in the northern part of the Bay of Cárdenas. Cupey shoal is situated in the southern part of the Bay of Cárdenas. The shoals Cruz del Padre and Galindo extend farther north than any of this group of shoals.

On the shoals of Piedras, Diana, and Cruz del Padre are stationed lighthouses.

GULFS, BAYS, AND ANCHORAGES.

GULFS.—The small gulf of Jucaro extends inland from the southeastern corner of the Bay of Cárdenas.

BAYS.—The principal bays are Matanzas and Cárdenas, which are fully described under the towns of the same name. Maya is a small bay east of Matanzas Bay, lying between the points Maya and Camacho.

ANCHORAGES.—Escondido, Canasi, and Becunayagua are anchorages on the northwestern coast. Camarioca is an anchorage about midway between the bays of Matanzas and Cárdenas and Jucaro (above described), which, in addition to being a gulf, is also an anchorage.

PENINSULAS, CAPES, AND POINTS.

PENINSULA.—Hicaco is the only peninsula of this province, and juts out from about the central part of its northern coast, forming the western boundary of the Bay of Cárdenas.

POINTS AND CAPES.—The greatest number of points are found projecting from the northern coast of the district of Matanzas, which is in the western part of the province. Among these are the points Escondido, Guanés and Seboruco. The points Gral Rubal cava, Uvero Alto, Sabanillo, Gorda and Maya project from the Bay of Matanzas. Point Goxojal extends from the eastern side of the Bay of Cárdenas. Point Unioa projects from the extreme eastern point in the coast, and Point Comacho is another small point on the eastern coast.

Cape Hicaco has two smaller points, Frances and Molas, projecting from it. It is situated in the northern extremity of the long and narrow peninsula which shelters Cárdenas Bay to the northward. The point is low and has a few huts upon it. The shore to Maya Point is steep-to and may be approached within one mile, but is low, sandy, and covered with brushwood, the beaches being here and there interrupted by low bluffs. The bank of soundings extends only $\frac{1}{2}$ mile off shore.

Eight miles west of Icacos Point is a small cove called Varadero Bay. Four miles farther to the WSW. is the point and landing of Camacho, low and sandy. Five and one-half miles eastward of Maya Point is the mouth of the Camaricoa River, on the left bank of which is the town of the same name.

MANGLE POINT.—A rocky ledge extends off Piedras Point for some distance, having 15 feet water on it, and near the point are some rocks on which the sea breaks; at $2\frac{1}{4}$ miles S. 24° E. (S. 28° E. mag.) of the point the depths increase to 5 fathoms, rocky bottom. From Piedras Point, the coast, bordered by a bank, trends SSW. for 8 miles to Cape Frances, and thence SW. by W. 5 miles to Mangle Point. This point is low, and there is nothing to mark it except the bend of the coast and a fisherman's hut west of it on a small sandy beach. It is skirted by a reef which extends off 400 yards, and is steep-to.

Before proceeding further with the description of the coast we will give a general description of the shoals, cays, etc., lying south of Batabanó.

It is but very seldom that a man-of-war or a merchant vessel needs any description of this neighborhood, and it must be remembered that no correct and complete survey has ever been made here.

MATERNILLOS POINT is $4\frac{1}{2}$ miles from the entrance to Port Nuevitas. The coast between is low, but free of danger. The point is surrounded by a coral reef called the Corona de Maternillos. From Maternillos Point as far westward as Icacos Point, a space of nearly 250 miles, the coast is bordered with low mangrove cays and reefs to the distance in some places of 20 miles from the mainland. The greater part to the westward of Paredon Point is but imperfectly represented on the charts, and, being studded with dangers, steep-to, should be most cautiously approached.

Light.—The lighthouse on Maternillos Point is 170 feet high, white, with the word Colon painted on it, and exhibits, 174 feet above the sea, a fixed and flashing white light every 48 seconds, duration of flash 5 seconds. The light should be visible 17 miles.

RAILROADS.

This province has the greatest number of miles of trackage of any province on the island, having some 355 miles of railroad, divided as follows:

1. From Habana to Matanzas and Bemba (Jovellanos), 90 miles, of which 44 miles are in the Province of Matanzas, single track, standard gauge, belonging to the Ferrocarriles Unidos.

2. From Güines to Matanzas, 39 miles, of which 13 miles are in Matanzas Province, single track, standard gauge, belonging to the Ferrocarriles Unidos.

3. From Habana to La Unión, 80 miles, single track, standard gauge, belonging to the Ferrocarriles Unidos, of which 12 miles are in the Province of Matanzas.

4. From Matanzas to Murga, 62 miles, single track, standard gauge, belonging to the Ferrocarril de Matanzas, with branch La Unión to Alfonso XII, 3 miles, and with branch from Navajas to Venero San Juan, 50 miles.

5. From Cárdenas, via Bemba and Santa Clara, 107 miles, of which 67 miles are in the Province of Matanzas, with branch from Bemba to Navajas, 11.5 miles, and from Colon to Guareiras, 6 miles, single track, standard gauge, belonging to the Ferrocarril de Cárdenas-Júcaro.

6. From Cárdenas to Yaguaramas, 67 miles, of which 50 miles are in the Province of Matanzas, single track, standard gauge, belonging to the Ferrocarril de Cárdenas-Júcaro, with branches as follows:

(a) Recreo to Itabo, 15 miles.

(b) Altamisal to Macagua, 21 miles.

1. HABANA-MATANZAS AND BEMBA RAILWAY.

TABLE OF DISTANCES.

HABANA (REGLA.)															} HABANA PROVINCE.																											
24	JARUCO.																																									
44	20	BOUNDARY OF PROVINCE, WEST.																																								
45	21	1	MOCHA.																																							
51	27	7	6	BENAVIDES.																																						
56	32	12	11	5	MATANZAS.																																					
62	38	18	17	11	6	GUANABANA.																																				
63	39	19	18	12	7	1	IBARRAS.																																			
67	43	23	22	16	11	5	4	CAOBAS.																																		
70	46	26	25	19	14	8	7	3	LIMONAR.																																	
74	50	30	29	23	18	12	11	7	4	SUMIDERO.																																
80	56	36	35	29	24	18	17	13	10	6	COLISEO.																															
82	58	38	37	31	26	20	19	15	12	8	2	TASCA.																														
86	62	42	41	35	30	24	23	19	16	12	6	4	MADAN.																													
90	66	46	45	39	34	28	27	23	20	16	10	8	4	BEMBA (Jovellanos).																												

[For table of distances from Habana to eastern boundary of Province of Habana, see Habana Province—"Habana-Matanzas and Bemba Railway."]

ITINERARY.

[For Itinerary, see Habana Province—"Habana-Matanzas and Bemba Railway."] Page 224.

2. GÜINES-MATANZAS RAILWAY.

[For table of distances from Güines to west boundary of Habana Province and for Itinerary, see Habana Province—"Güines-Matanzas Railway."]

GÜINES.

26	WEST BOUNDARY OF HABANA PROVINCE.				
27	1	MOCHA.			
33	7	6	BENAVIDES.		
39	13	12	6	MATANZAS.	

3. HABANA-LA UNIÓN RAILWAY.

[For table of distances from Habana to western boundary of Province of Habana and for Itinerary, see Habana Province—"Habana-La Unión Railway."]

HABANA.

46	GÜINES.				
68	22	WEST BOUNDARY OF HABANA PROVINCE.			
74	28	6	BERMEJA.		
80	34	12	6	LA UNIÓN.	

4. MATANZAS-MURGA AND VENERO S. JUAN RAILWAY.

TABLE OF DISTANCES.

Matanzas-Murga Line.

MATANZAS.

4	GELPI.				
6	2	GUANABANA.			
11	7	5	CIDRA.		
14	10	8	3	SABANILLA.	
19	15	13	8	5	LA UNIÓN.
26	22	20	15	13	8 BOLONDRON.
29	25	23	18	15	10 2 GUIRA.
33	29	27	22	19	14 6 4 NAVAJAS.
40	36	34	29	26	21 13 11 7 PEDROSO.
46	42	40	35	33	28 20 18 14 7 CLAUDIO.
52	48	46	41	38	33 25 22 18 11 4 CRIMEA.
55	51	49	44	41	36 28 26 22 15 8 4 JAGUEY GRANDE.
62	58	56	51	48	43 35 33 29 22 15 11 7 MURGA.

Navajas-Venero S. Juan Branch.

MATANZAS.

33	NAVAJAS.									
35	2	CORRAL FALSO.								
42	9	7	ISABEL.							
45	12	10	3	CUEVITAS.						
49	16	14	7	4	BARO.					
62	29	27	20	17	13	GUAREIRAS (JUNCTION).				
65	32	30	23	20	16	3	CORRALILLO.			
68	35	33	26	23	19	6	3	GUAREIRAS.		
71	38	36	29	26	22	9	6	3	CUMANAYAGUA.	
75	42	40	33	30	26	13	10	7	4	TASAJO.
77	44	42	35	32	28	15	12	9	6	2 S. TASOJITO.
80	47	45	38	35	31	18	15	12	9	5 3 S. DOMINGO.
83	50	48	41	38	34	21	18	15	12	8 6 3 VENERO S. JUAN.

ITINERARY.

Distances from
Matanzas.

14 miles.

Leaving Matanzas, this road travels to the south through a fertile level region, thickly populated, and enters the town of Sabanilla.

19 miles.

Here the road makes a heavy grade over a range of hills and descends again, entering the junction of La Unión, where it connects with the Habana-La Unión Road. A branch of this road 3 miles long runs from here to Alfonso XII.

26 miles.

From here it runs over a low flat country just at the edge of the Zampa Swamp, past the town of Bolodron, and enters the village of Guira, passing through a well-populated and cultivated region to the town of Navajas, where it connects for Cárdenas. A branch of this road runs from here to Venero San Juan, which will be taken up separately under the head of the "Navajas-Venero San Juan Branch."

33 miles.

Leaving Navajas the road turns south for some distance, skirting the eastern edge of the great swamp. The country is well settled and much cultivated. The road passes through the hamlet of Claudio, thence to the town of Jaguey Grande, and enters its present terminus—Murga, in the province of Santa Clara.

46 miles.

55 miles.

62 miles.

NAVAJAS-VENERO SAN JUAN BRANCH.

35 miles.

Leaving Navajas, this branch traverses a level strip of country and enters Corral Falso. Beyond here it crosses a trestle and enters a low flat country, passing between two small lakes or bayous, and enters the village of Isabel; thence, through an unbroken and unsettled region, to the town of Cuevitas.

42 miles.

45 miles.

62 miles.

From here it runs over a level country to Guareiras, a railroad junction, where it connects with the Cárdenas-Júcaro Railroad; crossing their tracks it traverses a level fertile region, passing the town of Cumanayagua, and thence to its terminus, the village of Venero San Juan.

71 miles.

83 miles.

5. CÁRDENAS-BEMBA AND SANTA CLARA RAILWAY.

TABLE OF DISTANCES.

CARDENAS.

8	CONTRERAS.												
15	7	CIMARRONES.											
18	10	3	BEMBA (JOVELLANOS).										
26	18	11	7	QUINTANA.									
29	21	14	10	3	CERVANTES (PERICO).								
35	27	20	16	9	6	RETAMAL.							
38	30	23	19	12	9	3	COLÓN.						
44	36	29	25	18	15	9	6	AGUICA.					
51	43	36	32	25	22	16	13	7	MACAGUA.				
53	45	38	34	27	24	18	15	9	2	S. PEDRO.			
65	57	50	46	39	36	30	27	21	14	12	ALVAREZ.		
67	59	52	48	41	38	32	29	23	16	14	2	Western Boundary of Matanzas Province.	
107	99	92	88	81	78	72	69	63	56	54	42	40	SANTA CLARA.

ITINERARY.

[For distances from Western Boundary of Matanzas Province to Santa Clara, see Santa Clara Province.]

Railroad shops at Cárdenas, large.—Ground marshy on either side of track, which is on *embankment*. Outskirts of town low and marshy; troops should stick to railroad for 1 or 2 kilometers out of town. *Switches, car shops.*

Huts, little cane or cultivation, cactus hedges here and there; country level and brushy, no hills, except far away on left. *Favorable for troops.*

Cane, stone walls, bananas, huts; very low cut. 4 k.—2.48 m.

Much cane; very low ridge some mile or so to the right; *sugar railroad* comes in from left; *troops could march along track*, experiencing little difficulty at a low place 100 to 200 yards long. 6 k.—3.72 m.

Country open and level; road along track. 7 k.—4.34 m.

Much cane, very red soil; dirt road along track; country level and open, *excellent for march of troops*. Large sugar mill and railroad to it on left. 8 k.—4.96 m.

Cane and meadows; country level. 9 k.—5.58 m.

Much cane, country open, low *rock cut* 8 or 10 feet high and 200 yards long, dirt road along track. 10 k.—5.72 m.

Flat, brushy, undulating country, with many palms; dirt road walled with stone near track on right; little cane; railroad straight and level. 11 k.—6.87 m.

About 12 kilometers two *side tracks*, *water-tank station of Contreras*; station for cane; cattle; *station house of stone, stock chute*; town composed of half a dozen frame houses; water pumped by windmill. *Stone warehouse, platform* for cane; country around flat and brushy, little or no cultivation, many palms. 12 k.—7.44 m.

- Distances from
Cárdenas.
- 13 k.—8.06 m. Level brushy fields; country seems low; no cultivation; palms; wire fences along track; wooden sleepers, road single track.
- 15 k.—9.30 m. Same; more brush.
- 16 k.—9.92 m. A little more cultivation.
- 17 k.—10.54 m. Very open level prairie; palms here and there; hedge along railroad. *Sugar road* from the right.
- 20 k.—12.50 m. Low dirt cuts; much cane; range of hills far away to left; country open; railroad single track; country roads good in dry season and of red dirt, probably muddy in wet weather; level open country; cane and meadows; very few cattle; curves in railroad; *excellent for march of troops*.
- 22 k.—13.64 m. *Cuts*, perhaps 10 feet high, and 200 or 300 yards long. Country more brushy; bananas, huts, *two side tracks*, and *station of Cimarrones*. *Stone station house, stone warehouse with platform for sugar, and stock chute*. Town flat, with brush and bananas around; houses largely of wood; town numbers probably 400 or 500 people.
- 23 k.—14.26 m. Low short cut; road straight; *old railroad* runs off to left, probably for sugar.
- 24 k.—14.88 m. Huts, country open, much cane and many ingenios; *low bridge*, probably 100 feet long, on *stone piers*, level with road.
- 26 k.—16.12 m. Country flat and clear, much cane; two lines of *telegraph*, one with three wires, the other with one.
- 27 k.—16.74 m. *Station of Jovellanos* (Bemba), 27 kilometers from Cárdenas. *Station house of wood. Several side tracks and switches, water tank and stock chute*. Country around very flat, no possibility of defensive works. Country open and considerable brush. * * *
- 29 k.—17.98 m. Country flat and open, much cane and many sugar mills (ingenios); soil, red clay; two *telegraph lines*, four wires on right and two wires on left.
- 33 k.—20.46 m. Between 32 and 33 kilometers, ruin of a station house (stone);
- 35 k.—21.70 m. sugar railroad to ingenios on left and small *side track and switch*. Just before 35 kilometers a branch to left, probably *sugar road*. Country very level, *excellent for progress of troops*, but no roads along railroad.

From Bemba (Jovellanos) a branch runs southwesterly across a level fertile country via Medina to Navajas, where it connects with the Matanzas road.

JOVELLANOS.	
8	MEDINA.
11.5	3.5
	NAVAJAS.

- 36 k.—22.32 m. Fields are very level, but more brushy, and much "diente de perro" (dog tooth). In many parts of Cuba the calcareous rock, which in places is but thinly covered with soil, rises above the surface in sharp, jagged points, which are often covered by grass. These regions are very difficult for horses or other animals to traverse near track.

Brush and diente de perro, cane in distance; single track and stone ballast. Distances from
Cárdenas.

Cane again; *thus far little trouble for troops to march along railroad*; a little beyond 38 kilometers a small *narrow-gauge sugar railroad* follows track; much cane. 37 k.—22.94 m.
38 k.—23.56 m.

Sugar road still follows track; cane; flat country, open, with palms and ceibas growing. Then *two side tracks and station of Quintana*. Merely a *stone station with platform for molasses, etc.* Water tank; water from well pumped by horse. Country flat; much sugar; avenues of palms. Region resembles that lying between Alquizar and the south coast. Sugar mills; nothing raised but cane. 39 k.—24.18 m.
40 k.—24.80 m.

Same expanse of cane, brush in distance; stone wall here and there. 41 k.—25.42 m.

Approaching 42 kilometers diente de perro begins to reappear; wherever this makes its appearance cultivation is for the time being interrupted. 42 k.—26.04 m.

Country better; cane land, very level; road straight as a bee line; cane and huts. Roadbed dirt ballast, red soil; probably roads of this region become bad in wet weather. 43 k.—26.66 m.

Cane, bananas here and there. No hills in sight; country level and open near track; vistas of trees and brushwood in distance. 44 k.—27.28 m.

Same aspect. No roads near track; slight *wire fences* here and there; single palms scattered over country. 45 k.—27.90 m.

Town of Perico. A railroad enters from right; *two side tracks and water tank*. Town of probably 800 or 1,000 inhabitants; composed of thatched huts, and stone or wooden houses, red-tiled. Country very flat here; no hills around. Many Chinese in this region. *Stone storehouse*. Flat, open cane country. Beyond town many bananas growing. The region is *excellent for the march of troops*, but *heavy in wet weather*; red soil. 46 k.—28.52 m.

Extensive grazing meadows, with cattle; cane; one or two small *culverts*. *Wire fences* on either side of road; no cuts or embankments of consequence since leaving Bemba. 48 k.—29.78 m.

Road well ballasted with stone, and smooth; single track. Cane and large meadows; cattle; ingenios. A very level country. Then a small, low *bridge*, 40 or 50 feet long. 49 k.—30.38 m.

Unimportant *bridge*. Country very open, and flat as a table. Cane and meadows; palms of course; a little yucca (Adam's needle, plant with farinaceous root, eaten like potato). *Small siding* here, and house. 50 k.—31.00 m.

Same country. A few little *culverts* beyond kilometer post. 52 k.—32.24 m.

Same country. Flat, dotted with palms; extensive meadows; cane fields; cattle; huts here and there. 53 k.—32.86 m.

A road, probably from ingenio, enters from left; then a house, and beyond *three side tracks and station of Betamal*. *Station built of stone*; water tank; stock chute; stone platform. No town. A road appears here to run to the right, probably a sugar road. 54 k.—33.48 m.

- Distances from
Cárdenas.
- Country on both sides somewhat brushy, but flat and apparently without *diente de perro*.
- 55 k.—34.10 m. Country still somewhat brushy, but *fairly good for march of troops* near railroad; low *bridge* about 100 feet long, apparently having new *stone abutments* built (1892).
- 57 k.—35.34 m. Country more open; meadows and grazing cattle; comparatively little cane.
- 59 k.—36.58 m. (About.) *Three side tracks; stone warehouse; a road from left, and then the town of Colon; water tank.* Town large, probably 10,000 or 15,000 inhabitants; houses of stone or wood, and tiled; town lies in flat region; *station* large and built of *stone*.
- 60 k.—37.20 m. At 60 kilometers (nearly) is a small low *bridge* about 100 feet long, on stone abutments; country flat and open; meadows.
- 61 k.—37.82 m. A little beyond 61 kilometers a *branch* or siding runs off to *right* to sugar mill.
- 62 k.—38.44 m. Country flat; meadows; a little brush to left; very level. Railroad at times not inclosed by walls or fences.
- 63 k.—39.06 m. In general, extensive meadows, with cattle, but just here a low *rock cut* 5 or 6 feet high and short; brush now and again; just beyond switch and house to *left a railroad* (probably sugar road) runs off in that direction.
- 64 k.—39.68 m. Small cornfield on left; generally meadows; then a little low *bridge*, about 50 feet long, on *stone abutments*; unimportant; road has stone ballast; *telegraph*, as before.
- 66 k.—40.92 m. More cane and wide meadows; country flat, but a trifle lumpy to left.
- 67 k.—41.54 m. Same; country less highly cultivated; sugar mill to left; soil seems less good; houses not so frequent; brush more frequent in distance.
- 68 k.—42.16 m. Railroad crosses a dirt road to sugar mill on left, from which seems to come a *small railroad*, striking ours at *station Aguica* at 69 kilometers.
- 69 k.—42.78 m. Here a *stone station, small stone warehouse, post office* (administración de correos), a *side track* or two, house or two, and little else. Beyond, more cane; country very level, meadows, huts, and cattle.
- 70 k.—43.40 m. Kilometer post in a low cut, height about to top of car, and 1,000 yards long.
- 71 k.—44.02 m. Railroad descends a somewhat steep grade, but country level in general, open, *excellent for march of troops*, and covered with cane. A low *bridge*, 100 feet long, on stone piers.
- 72 k.—44.64 m. A very short *side track* and little house; track perhaps goes to sugar mill ahead to left. Near 73 kilometers small low *bridge*, 50 feet long, on *stone arches*; 100 yards beyond 73 kilometers *another* of same kind and size over a little stream; about 100 yards beyond, *another* of the same kind, but about half the size; a little corn here; the country is *excellent for the march of troops*.

Country flat, open, with house or two; *side track and small railroad* (probably sugar road) from right; a little corn here, much cane, palms in distance, no brush; meadows with cattle and horses; sugar mills; a fine region.

Distances from
Cárdenas.
75 k.—46.50 m.

Near 77 kilometers a small siding, little house, and probably sugar road from left; then a little low *bridge* about 40 feet long on *stone abutments*.

77 k.—47.74 m.

Cane; country very level; road, stone ballasted; soil not so red; country open, and many cattle grazing; then *three side tracks and station of Macagua*, before coming to which is a small road to left. Station built of stone; *water tanks* here, *storehouse*, much cane. Wood for engines. Half a dozen houses and quarters for guardia civil; great cane fields; cattle and horses; a little corn near town; some brush, bananas, bushes, etc., near station.

78 k.—48.36 m.

Country brushy on either side; near by a few houses; a railroad goes off to right. Road good, stone ballast, and runs through one of the richest regions in Cuba.

83 k.—51.46 m.

Brushy, level fields on both sides, but huts here and there.

85 k.—52.70 m.

Still brushy fields, but *troops could march near track*; brush probably does not reach far. Railroad now descends short grade.

86 k.—53.32 m.

Brushy fields continue; grow worse, but there does not seem to be any *diente de perro*. Troops could clear a way through with little difficulty.

87 k.—53.94 m.

88 k.—54.56 m.

Same; little cultivation for several kilometers.

Same; no cultivation; palms and brush; ground level; *fair for troops*; a dirt road near track, which is now ballasted with dirt.

89 k.—55.18 m.

Same; a few cattle now; grass fair but coarse.

90 k.—55.80 m.

Same; road continues near track; no cultivation; no houses seen.

91 k.—56.42 m.

Same; brush; no cultivation; no swamps thus far along road; near 92 kilometers, stone ballast again.

92 k.—57.04 m.

Same conditions; then *town of San Pedro*; town chiefly of thatched huts; 100 or 200 inhabitants; *two side tracks, water tank, wooden station, and storeroom, with platform* for loading. Railroad seems to enter from left beyond San Pedro; cane fields to right; country level; brush to left.

93 k.—57.66 m.

Brush again, down grade, no cuts.

95 k.—58.90 m.

Brushy, level fields, but *fair for march of troops*; beyond a *switch* and little house.

96 k.—59.52 m.

Level, brushy fields, no cultivation on either side.

98 k.—60.76 m.

Cane to left, brush on right, level ground; still going down grade; old ingenio.

99 k.—61.38 m.

Huts and *town of Alvarez*; brushy, level country around; town composed of huts and tiled houses, chiefly of wood; a sugar cane *station* built of wood; *water tank and two side tracks*; population probably 200. This is evidently a charcoal region; stone casa—cuartel de la guardia civil—like an old for-

101 k.—62.62 m.

- Distances from
Cárdenas. tified place of stone. Just beyond town, small *cut*, then flat, brushy country continues. A few cattle, rail fences; wire fences along track.
- 102 k.—63.24 m. Brushy, level country, little or no cultivation; troops could move with facility.
- 103 k.—63.86 m. Same; more cattle; a few low cuts here; road dirt ballast.
- 104 k.—64.48 m. Brushy, stone *culvert*, as are all the culverts on this road; no cultivation.
- 106 k.—65.10 m. Down grade; country same, level and brushy, few houses; *little or no water* except at stations.
- 106 k.—65.72 m. Same; no fences, huts, or cultivation; down grade; *troops could move near track*; cuts here and there, but country level, no hills; *water probably scarce* here in the dry season, but frequent *culverts* indicate that there is plenty during wet season.
- 108 k.—66.96 m. Very brushy, and for a short distance might be *difficult for troops* to march, but road could be cut without much difficulty.
- 109 k.—67.58 m. *Station of Mordazo*. Two *side tracks*, *loading platform*, *wooden station*, *water tank* (water supply from well), a dozen houses, and what seems to be the palm, whose leaves are used for fans.
- 110 k.—68.20 m. Railroad on small short *embankment*; country level, brushy or wooded as before, no cultivation; good for march.
- 112 k.—69.44 m. Small *cut*.
- 113 k.—70.06 m. Country same; very low cut; brush on both sides, but *troops could move*.
- 114 k.—70.68 m. Same; no cultivation, no houses, few fences, down grade, frequent small *culverts*.
- 116 k.—71.92 m. Same; brush, *frequent low cuts*, country generally level, *troops could move*.
- 117 k.—72.54 m. Country more open, but wooded, chiefly palms, no cultivation; *excellent for march of troops*; roads now and again near railroad.
- 118 k.—73.16 m. Same; slightly down grade; more cattle.
- 119 k.—73.78 m. Country fairly open, no cultivation; *good for march of troops*.
- 120 k.—74.40 m. Country open, but no cultivation or houses (country similar to that about Palacio, Pinar del Río, Western Railroad); very level; easy marching; many palms.
- 122 k.—75.64 m. *Town of Manacas*, level brushy country surrounding; *two side tracks*. Town composed chiefly of frame houses, tiled; *station built of wood*, *water tank*; people chiefly Cubans, few Chinese, as there seem to be no sugar estates in neighborhood. Small *warehouse*, *loading platform*, and *stock chute*; *small railroad* comes in from right. Country beyond and at 123 kilometers brushy, level; no cultivation; *troops could move with ease*; again down grade, few low cuts; about 123 kilometers, a little cane to right.
- 124 k.—76.88 m. Ingenio and sugar road to left; now a little cane and corn; a small *rivulet*.

to the terminus—Santa Clara—104 miles from Cárdenas.

Altamisal-Macagua Branch.

CÁRDENAS.

22	ALTAMISAL.				
33	11	BANAGUISES.			
37	15	4	SAN JOSÉ DE LOS RAMOS.		
41	19	8	4	PALMILLAS.	
43	21	10	6	2	MACAGUA.

ITINERARY.

Distances from
Cárdenas. Leaving Cárdenas this line of road traverses along the coast to the town of Júcaro.

3 miles.
10 miles.
15 miles. From here it turns a little east of south running over a level fertile country through the hamlet of S. Antón de la Anegada enters the town of Recreo, where a branch runs east to Itabo, the itinerary of which will be given later.

22 miles. Beyond here the country is less inhabited and cultivated. The road traverses a vast plain to the station of Altamisal, where a branch runs to Macagua and connects with the Cárdenas-Santa Clara road.

28 miles. From here the road traverses a level fertile region thinly settled and little populated, until the railway junction of Retamal is reached.

35 miles. Here it crosses the tracks of the Cárdenas, Bemba, and Santa Clara line and thence on to Guareiras Junction where it crosses the tracks of the Matanzas and Venero San Juan road.

40 miles. Beyond here the country through which the road travels becomes somewhat low. The town of Guareiras is reached at a distance of 5 miles from Olivera.

44 miles. From here the road crosses a dreary waste of low lands and enters Calimete.

49 miles. Beyond Calimete the country becomes a little more rolling, the railroad following a low ridge enters the village of Amarillas.

From here the country becomes low again, habitations scattered and the soil but little cultivated. The road reaches its present terminus, Yaguaramas, at a distance of 67 miles from Cárdenas.

RECREO-ITABO BRANCH.

15 miles.
19 miles.
25 miles. Leaving Recreo this branch soon encounters a range of hills, swinging around these in gentle curves it travels due east, on its right a range of hills and on its left a vast open plain, passing the hamlet of Sabanilla it soon reaches the village of Hato Nuevo, nestling among the hills.

30 miles. Leaving here it soon reaches Itabo, its destination, 44 miles from Cárdenas.

ALTAMISAL-MACAGUA BRANCH.

33-37 miles. Leaving Altamisal this branch runs east over a level fertile region past the village of Banaguises, and enters the town of San José.

Here it turns south and traverses a region similar to that described above, past the village of Palmillas and enters its terminus, Macagua, where it connects with the Cárdenas, Bemba, and Santa Clara Railroad.

Distances from
Cárdenas.
41 miles.
43 miles.

ROADS.

The principal roads of this province are as follows:

1. From Matanzas to Molembo, 63 miles.
2. From Matanzas to Aguacate, 19 miles, of which 12 are in the province of Matanzas.

Total mileage of principal roads, 75 miles.

3. From Matanzas to Alfonso XII, 21 miles.
4. From Cárdenas, via Jovellanos, to Venero San Juan, 67 miles.
5. From Jovellanos, via Bolondron, to Güines, 66 miles, of which 40 miles are in Matanzas Province.

1. MATANZAS-MOTEMBO ROAD.

TABLE OF DISTANCES.

MATANZAS.										
8	GUANABANA.									
13	5	LIMONAR.								
18	10	5	SUMIDERO.							
22	14	9	4	COLISEO.						
30	22	17	12	8	CIMARRONES.					
35	27	22	17	13	5	CANONGO.				
42	34	29	24	20	12	7	ALTAMISAL.			
53	45	40	35	31	23	18	11	GUAMUTAS.		
63	55	50	45	41	33	28	21	10	MOTEMBO.	

ITINERARY OF ROAD.

Leaving Matanzas the road passes along the shores of the bay; on the right some low ridges, and further over, the railway.

Distances from
Matanzas.

About two miles from town it turns southward, crosses over the ridge and railway tracks. It recrosses the latter within a few yards, which it then follows for some distance over a rolling country, and gradually ascends until the town of Guanabana is reached at a distance of 10 miles.

2 miles.

Beyond the town it crosses a rough, hilly country, passing over the Canimar river just north of the village of that name, and then traverses a more level and fertile region until Limonar is reached.

8 miles.

10 miles.

13 miles.

Leaving Limonar, the road follows the railway through a narrow little valley with tall bluffs on either side, until the village of Sumidero is reached.

18 miles.

Distances from Matanzas.	Beyond the village the valley widens on the right of the road and becomes a rolling plain, fertile and well cultivated, while on the right the ridges above mentioned are still to be seen, which the road gradually approaches until it skirts around the last hill of the range in gentle curves and enters the little hamlet of Colisero.
22 miles.	From here the road runs parallel with the railway for a short distance, through a fairly level country, until a range of hills on its right is encountered. Sweeping around the base of these it enters the village of Cimarrones.
30 miles.	A short distance beyond the city limits it crosses the tracks of the Bemba branch of the Cárdenas-Júcaro Railway, sweeps around the base of the ridges on its right and enters a level, fertile region, passing the hamlet of Canongo, with the range of bluffs on the right still to be seen in the distance, which soon disappears, and the country opens out into a beautiful, rolling plain, with now and then a plantation to be seen. At a distance of about 7 miles from the last-mentioned place the road enters the village of Altamisal.
35 miles.	Leaving Altamisal the road soon crosses the Santa Clara Branch of the Cárdenas-Júcaro Railway, and enters a somewhat low, flat country, crossing many little creeks, and finally enters the town of Guamutas.
42 miles.	Beyond the town it passes a small bayou and crosses over a great plain, well watered and fertile, and enters the village of Motembo, at a distance of 63 miles from Matanzas, on the line between the provinces of Matanzas and Santa Clara. Here the road branches out in various directions and will not be described further.
53 miles.	
63 miles.	

2. MATANZAS-AGUACATE ROAD.

TABLE OF DISTANCES.

MATANZAS.

11	SEIBA MOCHA.
19	8 AGUACATE (HABANA PROVINCE).

ITINERARY OF ROAD.

Distances from Matanzas.	Leaving Matanzas the road traverses westward through an undulating country for a distance of 1 mile, when it separates, one road going to the north and the other, the main road, running west between the range of hills on the right and the San Austin River on the left.
1 mile.	
4 miles.	At a distance of 7 miles it crosses over a small bluff and descends into a little valley which it crosses.
7 miles.	It then leaves the river to the left and slowly ascends and crosses over a bluff, from the summit of which can be seen the town of Seiba Mocha in the valley below. Entering the valley it crosses a small creek and traverses a level region until the town of Seiba Mocha is reached.
9 miles.	
11 miles.	

Beyond the town for a distance of a mile the road crosses an undulating country. Here it crosses over a small hill and enters a level fertile region, much cultivated and inhabited. At a distance of 16 miles from Matanzas it enters the village of Aguacate.

Distance from
Matanzas.

16 miles.

3. MATANZAS-SABANILLA-ALFONSO XII ROAD.

TABLE OF DISTANCES.

MATANZAS.				
8	T. BAÑOS DE SAN PEDRO.			
11	3	MOLINA.		
15	7	4	SABANILLA.	
21	13	10	6	ALFONSO XII.

4. CÁRDENAS-JOVELLANOS-VENERO SAN JUAN ROAD.

TABLE OF DISTANCES

CÁRDENAS.

8	LAGUNILLAS.			
15	7	CIMARRONES.		
18	10	3	JOVELLANOS.	
28	20	13	10	ROQUE.
38	30	23	20	10 GUAMAJALES.
48	40	33	30	20 10 GUAREIRAS.
50	42	35	32	22 12 2 CUMANAYAGUA.
58	50	43	40	30 20 10 8 TASAJO.
63	55	48	45	35 25 15 13 5 SAN DOMINGO.
67	59	52	49	39 29 19 17 9 4 VENERO SAN JUAN.

JOVELLANOS-BOLONDRON-GÜINES ROAD.

TABLE OF DISTANCES.

JOVELLANOS.

22	BOLONDRON.			
30	8	ALFONSO XII.		
43	21	13	NUEVA PAZ.	
66	44	36	23	GÜINES.

(Habana Province.)

JUDICIAL DISTRICTS, TOWNSHIPS, CITIES, AND TOWNS.

Judicial district (partido judicial).	Township (ayuntamiento).
Alfonso XII	{ Alfonso XII. Bolondron. Sabanilla del Encomendador. San Antonio de Cabezas. Unión de Reyes.
Cárdenas	{ Cárdenas. Cimarrones. Guamutas. Guanajayabo. Lagunillas.
Colón	{ Cervantes. Colón. Cuevitas. Jovellanos (or Bemba). Macagua. Macuriges. Palmillas. Roque. San José de los Ramos.
Matanzas	{ Canasi. Corral Nuevo. Guamacaro. Matanzas. Santa Ana.

I. JUDICIAL DISTRICT OF ALFONSO XII.

Population, 21,134; area, 211 square miles.

Townships.	Population.
1. Alfonso XII	3,000.
2. Bolondron	11,816 (6,457 white and 5,359 colored).
3. Sabanilla del Encomendador ...	8,871 (3,544 white and 5,327 colored).
4. San Antonio de Cabezas	10,800.
5. Unión de Reyes	8,169.

1. AYUNTAMIENTO OF ALFONSO XII.

ALFONSO XII (formerly Alacranes), a town of 3,000 inhabitants, is the capital of the ayuntamiento, situated on the branch road about 4 miles south of La Unión, which is on the main trunk line to Habana, and 20 miles from Matanzas. Its commerce is quite important. It has fine edifices and a parochial church. Post office and telegraph station.

2. AYUNTAMIENTO OF BOLONDREON.

Capital, Bolondron.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Galeon	5	
2. Guira (La)	2½	
3. Zapata	5½	

BOLONDREON is a town of 1,758 inhabitants (818 white and 940 colored), situated 27½ miles from Matanzas. Railroad to Matanzas. Post office.

2. AYUNTAMIENTO OF SABANILLA DEL ENCOMENDADOR.

SABANILLA DEL ENCOMENDADOR is a town of 2,961 inhabitants (2,291 white and 670 colored), situated 6 miles from Alfonso XII and 14 miles from Matanzas. It is on the Matanzas Railroad, between Matanzas and La Unión. There are 21 sugar mills and 27 stock farms (only 2 of which manufacture sugar; the rest are now plantations). Government quarters here. Post office and telegraph station.

4. AYUNTAMIENTO OF SAN ANTONIO DE CABEZAS.

Capital, San Antonio de Cabezas.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Bermeja	5	1,800 inhabitants. Villanueva Railroad.
2. Bija	3½	
3. Lima	2½	
4. Magdalena	3	
5. Montaña	-----	

SAN ANTONIO DE CABEZAS is a town of 1,500 inhabitants, situated 10 miles from Alfonso XII. Country fair on June 13. Matanzas Railroad. Post office.

5. AYUNTAMIENTO OF UNIÓN DE REYES.

UNIÓN DE REYES is a town of 4,100 inhabitants, situated 3½ miles from Alfonso XII. Villanueva and Matanzas railroads; telegraph line to Alfonso XII. Post office.

II. JUDICIAL DISTRICT OF CÁRDENAS.

Population, 53,882; area, 803 square miles.

Townships.	Population.
1. Cárdenas	
2. Cimarrones	8,746
3. Guamutas	14,675
4. Guanajayabo	8,182
5. Lagunillas	7,550

1. AYUNTAMIENTO OF CÁRDENAS.

Capital, Cárdenas.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Cantel	9½	
2. Guasimas	9½	
3. Varadero13½	

ROUTES TO CÁRDENAS.

1. From Habana by water.
2. By United Railway, via Matanzas to Bemba, then Cárdenas-Júcaro Railroad.

CÁRDENAS, a city of 20,505 inhabitants, is capital of the judicial district of the same name, and is situated on the north coast. It is 31½ miles from Matanzas and 85 miles from Habana, with which it is in frequent communication by steamers and by rail. It has many fine buildings; among them are the market place, the second in importance on the island, railroad station, town hall, Spanish casino, Spanish bank, hospital, firemen's quarters, public school, and the Columbus Monument. It has an agricultural board, a board of industry and commerce, a board of education, a board of health, and an inspector of barracks, and superintendent of prisons. It has two theaters; it has tanneries, distilleries, sugar refineries, and cigar and tobacco factories, and is lighted by electricity and gas. Post office, telegraph, and telephone. Cárdenas and Júcaro Railroad station here.

The town of Cárdenas was not settled until 1828, but is now one of the most flourishing towns on the island, owing to the large number of Americans who are engaged in business there, and who form a large portion of the mercantile community. Sugar is the chief article of export. The total exports to the United States in the fiscal year 1895-96 were \$2,920,905; of this, sugar represented \$1,872,626. About half the imports are from the United States.

The temperature is pleasant during the winter, but from about the middle of May to the middle of October the weather is hot and sultry, the thermometer standing 94° in the shade during the day and falling only 5° at night. Sanitary conditions are bad. Yellow fever, typhus, typhoid, and pernicious fevers prevail throughout most of the year, being worse in the hot season. Cases of smallpox also appear at times. The death rate is about 40.

The town is located directly on the Bay of Cárdenas, and is now the third port of entry in importance in Cuba, ranking next after Habana and Matanzas. It is 25 miles due east of Matanzas, but by railroad the distance is double this. Two railroads diverge from it; one proceeds 18 miles due south to Bemba, connecting there with the main railroad system of the island; the other railroad passes to the southeast, crosses the main trunk line at Colon, and terminates at Yaguaramas. On this latter road is located the inland town of Recreo, about 14 miles from Cárdenas. The town is about 7 blocks in width, extending from the wharves some 20 blocks inland to the southwest. One-third of this length is flanked on each side of a mangrove swamp, either boggy or covered with water. The original site was a mangrove swamp. From the wharves and between the present lateral swamps the ground gradually rises from 3 to 12 feet above the sea. The center of population is only 4 feet above sea level. Since 1872 Cárdenas has had an aqueduct which supplies water from a subterranean river, 1 mile distant from the town, which furnishes an abundant supply at a cost of \$3.00 gold per month for each faucet. The well water and that from underground cisterns is brackish and not potable, so that as a rule the poor purchase their water from the street carriers. The streets are about 40 feet wide, straight, not paved, and ill-drained. The houses are generally built of stone, and rarely more than one story high.

The Bay of Cárdenas, which is 12 miles long by 18 miles wide, is reported to be entirely without defense. The coast is so entirely unprotected that the line between Matanzas and Cárdenas has been a favorite resort for those wishing to land arms and ammunition for the insurgents. There are no fortifications and no artillery in position about the bay. There is at present only one buoy in the bay, and it is not safe for any vessel drawing more than 15 feet to attempt to enter inside of this buoy. Near the shore it is so shallow that the anchorage ground is from $\frac{1}{4}$ to 2 miles distant from the shore. There are about 25 wharves, 60 to 200 feet from each other, and extending 100 to 300 yards from the shore into the water. Fifteen feet of water can be found all the way in the bay to a distance of less than 2 miles from the city, and 10 feet of water can be found almost up to the wharves. The pilots are almost all Spaniards. The territory south of Torriente is an almost impenetrable swamp, whose intricacies are known only to natives. The city is also practically defenseless. At various points on the outskirts blockhouses have been constructed for the protection of small detachments against raids by the insurgents. They occupy a ground space of about 500 square feet each, are composed generally of sandstone, the walls being about 2 feet in thickness, are without artillery, and are serviceable merely for the protection of soldiers who are willing to fight under cover only.

SAILING DIRECTIONS.

CÁRDENAS stands on the swampy shore at the SW. side of the bay, and is a place of considerable commerce, and communicates by means of a railroad with Habana and Matanzas. The town of Signapa is westward of Cárdenas.

Sanitary condition is good, streets are well laid out, broad and clean. The city is lighted by gas and electric lights.

There are five machine shops where repairs to machinery and iron vessels can be made.

The United States is represented by a commercial agent.

Steamers.—One line small steamers sails weekly inside the cays to Caibarien, also a line from Habana every ten days to Caibarien, stopping at Cárdenas each way. The Ward line from New York calls every three weeks.

There is telegraphic communication with all parts of the world. The Government reserves the right to demand a translation of all messages.

Pilots are not necessary unless going up to the city, but pilotage is compulsory to all vessels except those under 80 tons. Vessels of from 80 to 100 tons pay \$13. English vessels pay \$1 more. No light or tonnage dues.

Light.—A fixed white light is exhibited from an iron column on the west side of Diana Cay, nearly a mile SE. of Mangle Cay. The light is 46 feet above the sea and may be seen 9 miles.

Directions.—Vessels bound to the ports on the north side of Cuba, eastward of Cárdenas Bay, should approach them from the eastward. The Old Bahama Channel is seldom navigated from west to east, except by steamers and coasters.

CÁRDENAS BAY is bounded on the north side by a very narrow strip of low, sandy, wooded land, which terminates to the eastward of Icacos Point; the entrance to this bay is so blocked up by small cays and shoals that it is only navigable for vessels of about 11 feet to the anchorages of Cárdenas and Signapa.

The best channel for entering this bay is that between Buba, or Mangle, Cay and Diana Cay. The bottom in the channel between Chalupa Cay and Diana Cay is very irregular, and in the center of the passage are some rocks, over which there is a depth of 8 feet. This channel is only frequented by small vessels. Even the most recent charts of this locality are not to be strictly depended upon. It is reported by the local authorities and captains of vessels visiting Cárdenas that 15 feet can be carried into the anchorage off the city at high water. The reefs are said to be growing in ridges to the northward and eastward.

Two buoys are moored to mark the eastern and southern extremes of a sand bank stretching off Molas Point; these should be left to starboard on entering. The next three buoys mark dangers between Diana and Buba Cays, and they should be left to port on entering. Pass between the next two buoys to the southward, the eastern of which marks the southwestern extreme of the bank extending southwestward from Diana Cay, and leave the next three buoys on the port hand, entering from seaward, when, having passed the western one, a course may be steered direct for the anchorage off Cárdenas.

2. AYUNTAMIENTO OF CIMARRONES.

Capital, Cimarrones.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Cañongo	5	
2. Río Nuevo.....	4½	
3. Roble	12	
4. Santa Teresa.....		
5. Toxea	4½	

CIMARRONES is a town of 3,000 inhabitants, situated 13½ miles from Cárdenas. Cárdenas and Júcaro Railroad station. It is on the calzada (highway) running east from Matanzas.

3. AYUNTAMIENTO OF GUAMUTAS.

Capital, Hato Nuevo.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Altamisal	14	Cárdenas and Júcaro Railroad. Post office. 2,057 inhabitants; Cárdenas and Júcaro Railroad; telegraph station.
2. Guamutas	6	
3. Itabo	4½	
4. Molembo	14½	Cárdenas and Júcaro Railroad.
5. Perico		
6. San Blas.....	11½	
7. Sierra Morena		
8. Teja (La).....	18½	

HATO NUEVO is a town situated 19 miles from Cárdenas. It is a railroad station.

4. AYUNTAMIENTO OF GUANAJAYABO.

Capital, Recreo.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Altamisal	3	
2. Carolina.....	3	
3. Minas	2	
4. Piedras.....	3½	
5. Rancho del Medio.....	3	
6. Sabanilla de la Palma.....	4	
7. San Anton de la Ane- gada.	4	Cárdenas and Júcaro Railroad.
8. Tres Seibas.....	3	

RECREO is a town of 2,879 inhabitants, capital of the jurisdiction, situated 17½ miles from Cárdenas. Cárdenas and Júcaro Railroad. Post office.

5. AYUNTAMIENTO OF LAGUNILLAS.

Capital, Lagunillas.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Contreras	3	
2. Esquina de Tejas	1	
3. Júcaro (El)	10	
4. Mameyes	4	
5. Pendejeras	10	
6. Signaguas	7	

LAGUNILLAS is a town of 7,030 inhabitants (4,023 white and 3,007 colored), capital of the jurisdiction, situated 7 miles from Cárdenas. Cárdenas and Júcaro Railroad.

III. JUDICIAL DISTRICT OF COLON.

Population, 80,872; area, 1,474 square miles.

Townships.	Population.
1. Cervantes	4,000.
2. Colon	18,000.
3. Cuevitas	6,551.
4. Jovellanos (or Bemba)	9,000.
5. Macagua	13,410.
6. Macuriges	13,500 (4,000 white and 9,500 colored).
7. Palmillas	3,108.
8. Roque	6,750.
9. San José de los Ramos	9,500.

1. AYUNTAMIENTO OF CERVANTES.

CERVANTES is a town of 1,560 inhabitants, situated 12½ miles from Colon. Cárdenas Railroad to Júcaro.

2. AYUNTAMIENTO OF COLON.

Capital, Colon.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Amarillas	23	Cárdenas and Júcaro Railroad.
2. Calimete	17½	
3. Jagüey Grande	27½	Railroad to Navagas and Matanzas.

ROUTES TO COLON.

1. From Habana by United Railroad to Bemba, and then by Cárdenas, Bemba, and Santa Clara branch of Cárdenas-Júcaro Road.

2. From Habana by sea to Cárdenas, and then by road.

COLON is a town of 7,000 inhabitants, capital of the judicial district of the same name, situated 64 miles from Matanzas. It is on the railroad between Santa Clara and Matanzas. It is the center of the sugar-cane district, and is next to Cárdenas in the number of its sugar refineries. There is a military post here. It has electric street-lighting, a board of education, a board of assessments, a charitable board, a prison board, and a health commission. A bronze statue of the "Great Admiral" is erected in the Isabel Park. Post office and telegraph station.

Through the Spanish commission the following statement is made regarding yellow fever here: "Yellow fever does not prevail in Colon in any form. During the war more than 100 soldiers in the hospital here failed to present a single case, which makes it evident that yellow fever is not indigenous to Colon." From other sources it is claimed that an epidemic occurred in 1865. Post office, telegraph and railroad station.

8. AYUNTAMIENTO OF CUEVITAS.

CUEVITAS is a port of 1,629 inhabitants, situated 18 miles from Colon. Matanzas Railroad to Colon. Telegraph station.

4. AYUNTAMIENTO OF JOVELLANOS (OR BEMBA).

Capital, Jovellanos (or Bemba).

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Bemba (Soledad de)---	$\frac{1}{2}$	Matanzas Railroad to Colon.
2. Isabel (or Las Jiquimas)	10	
3. Jabaco -----	16	
4. Realengo -----	$7\frac{1}{2}$	

JOVELLANOS (or Bemba) is a town of 6,000 inhabitants, situated 20 miles from Colon. It lies in a flat region, overgrown by brush. The streets are lighted by gas and there is an aqueduct which furnishes the city with drinking water. Cárdenas, Júcaro, and La Bahía railroads.

5. AYUNTAMIENTO OF MACAGUA.

Capital, Macagua.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Agüica	3	Cárdenas and Júcaro Railroad.
2. Alava (or Vergara) ..	1	
3. Arabos (Los)	2	
4. Banagüises	4½	Cárdenas and Júcaro Railroad.
5. Cuatro Esquinas	1	
6. Guachinango	1	
7. Guerrero	2	
8. Monte Alto	1	
9. San Pedro de Mayabon	6	Cárdenas and Júcaro Railroad.
10. Semillero	4½	
11. Tinguaro	-----	

MACAGUA is a town of 8,000 inhabitants, situated 11 miles east of Colon. Railroad junction between Colon and Santa Clara. Center of great sugar-raising district. Post office and telegraph station.

6. AYUNTAMIENTO OF MACURIGES.

Capital, Macuriges.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Batalla	20½	Railroad station.
2. Corral Falso	3	(For description, see below.)
3. Ciego (El)	3½	
4. Claudio	9	
5. Linche	10	
6. Medina	2½	Cárdenas Railroad.
7. Montalvo	5½	Matanzas Railroad.
8. Navajas	5½	Cárdenas and Matanzas Railroad.
9. Platanal	13½	
10. Punta Brava	7	
11. Ranchuelo	4½	
12. Rio Blanco	7	
13. Tramojos (or Pedroso)	10	Railroad station.

CORRAL FALSO is a town 24 miles from Colon, having many sugar mills and distilleries. Matanzas Railroad. Post office.

MACURIGES is a town of 3,650 inhabitants (3,200 white and 450 colored). Capital of the ayuntamiento of the same name.

7. AYUNTAMIENTO OF PALMILLAS.

PALMILLAS is a town of 1,014 inhabitants, situated 10 miles from Colon, on a branch of the Palma River. The nearest station is Agüica, 5 miles distant.

8. AYUNTAMIENTO OF ROQUE.

Capital, Roque.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Caovillas	10	Cárdenas and Júcaro Railroad. Post office.
2. Quintana	2½	
3. Tomeguin	7½	

ROQUE is a town of 800 inhabitants, situated 10 miles from Colon. It is 23 miles southeast of Cárdenas and 2 miles south of the railroad between Jovellanos and Colon. It has 14 sugar plantations, 30 stock farms, 400 cultivated farms, and 3 coffee plantations. Produces plantain trees and sugar in abundance. A good quality of banana is raised here.

9. AYUNTAMIENTO OF SAN JOSÉ DE LOS RAMOS.

Capital, San José de los Ramos.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Pijuan	12½	Cárdenas and Júcaro Railroad.

SAN JOSÉ DE LOS RAMOS is a town of 570 inhabitants, situated 12½ miles from Colon. Railroads from Cárdenas, Júcaro, and Santa Clara. Post office.

IV. JUDICIAL DISTRICT OF MATANZAS.

Townships.	Population.
1. Canasi	4,500
2. Corral Nuevo	12,575
3. Guamacaro	10,246
4. Matanzas	
5. Santa Ana	8,239

1. AYUNTAMIENTO OF CANASI.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Botina	16	
2. Canasi (Almacenes de)	3	
3. Concuni	3	
4. Facenda		
5. Puerto Escondido	6	
6. San Damian	2½	

CANASI is a town situated 17½ miles from Matanzas. The nearest station is Aguacate, 10½ miles away. Post office.

2. AYUNTAMIENTO OF CORRAL NUEVO.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Bacunayagua	9	
2. Cumbre (La)	13	
3. Figueras	16	
4. Mazamorra	13	
5. Portocarrero	7	
6. Puerto Escondido	9½	
7. Seborucal	7	

CORRAL NUEVO is a town of 2,092 inhabitants, situated 7 miles west from Matanzas.

3. AYUNTAMIENTO OF GUAMACARO.

Capital, Limonar.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Canimar	4½	
2. Caobas	3	Railroad.
3. Coliseo	8	Railroad which connects with the narrow gauge of the Guamacaro Valley.
4. Guamacaro	3½	Narrow-gauge railroad.
5. San Miguel de los Baños	11	(For description see below.)
6. Sumidero	3	Railroad and telegraph station.

LIMONAR is a town of 2,000 inhabitants, capital of the township, situated $13\frac{1}{2}$ miles from Matanzas.

SAN MIGUEL DE LOS BAÑOS.—This little village, situated about 12 miles southeast of Matanzas and 20 miles southwest of Cárdenas, is a summer watering place, noted for its hot sulphur springs. It occupies an elevated position between the Jucan Mountains about 2 miles from the railroad. It is in summer a resort much frequented by the wealthy living in the adjacent cities and country, because it is practically free from yellow fever.

4. AYUNTAMIENTO OF MATANZAS.

Capital, Matanzas.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Aguacate (Baños del)	$12\frac{1}{2}$	On railroad between Matanzas and Jovellanos. On calzada (highway). Population, 330.
2. Arroyo la Vieja....	11	
3. Bellamar (Playa de).....	1	
4. Bermejál.....	3	
5. Boca.....	$17\frac{1}{2}$	
6. Camarioca.....	$7\frac{1}{2}$	
7. Campana.....	$3\frac{1}{2}$	
8. Cañas.....	$3\frac{1}{2}$	
9. Cotorras.....	5	
10. Chirino.....	$5\frac{1}{2}$	
11. Laguna Larga.....	$5\frac{1}{2}$	
12. Limonar.....	$18\frac{1}{2}$	
13. Mazamorra.....	1	
14. Molinos (Los).....	1	
15. Naranjal.....	$\frac{1}{2}$	
16. Purgatorio.....	$2\frac{1}{2}$	
17. Río Grande.....	$2\frac{1}{2}$	
18. San Agustín de Paso del Medio.	2	
19. San Antonio.....	3	
20. San Francisco de Paula.	10	
21. Seiba Mocha.....	$3\frac{1}{2}$	
22. Sitios Nuevos.....	3	

EMPALMA is a junction of the railroads from Habana and Güines to Matanzas. It has a very good stone station.

ROUTES TO MATANZAS.

1. From Habana by water.
2. From Habana by United Railway.

MATANZAS (San Carlos de) is a city of 50,000 inhabitants, capital of the province, situated on the Matanzas Bay 75 miles by road from Habana.

It is the second commercial city on the island and vies with Habana in wealth and culture. It has scientific, art, and literary organizations, three churches, custom-house, hospital, jail, and arena. The most noted buildings are the Estéban theater, the Spanish casino, the Lyceum, La Unión (a building owned by a society of colored people), the barracks, the governor's palace, the municipal hospital, and the asylum of San Vicente de Paul. It has many charitable organizations and colleges. Among the promenades (paseos) the following deserve mention: La plaza de Armas, la plaza de Judios, Ermita de Monserrat, the el paseo de Santa Cristina, and Valle del Yumuri. Three and one-half miles east of this city are the Bellamar caves, which are admired by all strangers who visit them. Post office and telegraph station.

Matanzas was first settled in 1693. It is 54 miles west of Habana, by the most direct of the two railroads which unite these two cities. It is divided into three districts, viz: the central district of Matanzas, about half a mile in width, which lies between the two little rivers, San Juan to the south and the Yumuri to the north; the Pueblo Nuevo district, south of the San Juan and around the inland extremity of the harbor; and the district of Versailles, north of the Yumuri, the most healthful district in the city, because nearest to the open sea. There is a fine masonry bridge over the Yumuri which cost in the neighborhood of \$250,000. About two-thirds of the population are in the district of Matanzas, and the Pueblo Nuevo district has about double the population of Versailles. Pueblo Nuevo stands on ground originally a swamp, and is flat, and only 3 or 4 feet above the sea. The Matanzas district is low on the harbor front, and on the banks of the two rivers which inclose this district, but from the front the ground ascends until it reaches an elevation of 100 feet above the sea. However, the public square, which is the center of the most thickly populated section, is only about 20 feet above the sea level. Versailles is on a bluff overlooking the harbor, and the greater part of the houses are situated from 15 to 40 feet above the sea. The district of Matanzas has sewers in two streets only, and these are useless, as no houses are connected with them. The section of this district and that of Versailles which is built on the hill slope is naturally well drained, but the Pueblo Nuevo district and those parts of Matanzas built in immediate proximity to the banks of the river are very poorly drained. The chief warehouses, distilleries, and sugar refineries are on the south of the river San Juan, easily accessible to railroads and lighters. The principal industries are rum distilling, sugar refining, and manufacture of guava jelly. There are car and machine shops here.

Since 1872 Matanzas has had an aqueduct from the Bello spring, 7 miles distant. The supply is alleged to be both abundant and excellent. But of the 4,710 houses in the city, 840 stand on the hills outside the zone supplied by the waterworks, while of the remaining 3,870 houses within the zone only 2,000 get their water from the waterworks company. More than half of the houses of Matanzas get their supply from kegs of water sold on the streets. There are a few public fountains and wells, but the water from them is not good. Personal inspection of the houses of the poor working class invariably discloses a defective water supply. In several instances barrels of rain water repulsively abounding in wiggletails and tadpoles were found in the back yard, and on inquiring if the water was used for drinking, the answer was invariably "yes," without the least manifestation of discontent or repugnance.

The streets are 30 feet wide, with a 24-foot wagonway. Few of them are paved, but for the most part they are in good condition. In the Matanzas district some of the streets are of the natural foundation rock of the place, for the superficial soil is so thin that this porous rock often crops out. Most of the houses, which are built of this stone, are not so crowded, and are better ventilated than the houses of Habana. As is usual in Cuba, the ground floors are generally on a level with the sidewalks, and some are even below the level of the streets. A heavy rain floods many of the streets of Matanzas, the water running back into and beneath the houses. However, the porous limestone, of which the houses are built, greatly favors absorption.

Matanzas has the reputation of having long suffered annually with yellow fever. Sixteen kinds of fever are known in this city. The death rate is about 45.

The harbor is about $2\frac{1}{2}$ miles long on the northwestern shore, and about 5 miles long on the southeastern coast. It is 3 miles wide at its entrance and $1\frac{1}{2}$ wide at the anchorage ground. This extends from one-third to two-thirds of a mile out from the shore, opposite Versalles. There is but one wharf, which is in a rotten and dilapidated condition. It projects from the center of the Matanzas district, midway between the San Juan and the Yumuri rivers. This wharf extends some 200 feet out into the harbor, but as there is only 6 to 8 feet of water about it, only small coasters and lighters can tie up to it. The San Juan River, 100 feet wide, and the Yumuri, about 40 feet wide, are at this place inlets of the sea rather than independent rivers, for if either be ascended to where tide water ceases they are found to be comparatively insignificant streams.

The harbor of Matanzas is a large body of water compared to that of Habana, and as it receives the refuse from a city only one-fifth the size of Habana, the comparative pollution is insignificant. Ballast may be found in the open lot at the foot of Ayuntamiento street. It consists of rock of many kinds, granite, selenite, sandstone, limestone, etc. The southern shore of the harbor has low regular hills, covered with brush. The north shore is 20 or 30 feet high; bold and rocky but level.

There are no calzadas (highways) from Matanzas to the interior and no direct road to Habana. Dirt roads go to Habana by way of Güines, but they are very bad. There are three railroads, however; one to Habana via Regla, one to Güines, and one to Murga with branch from Navajas to Venero San Juan. A road extends along the north shore of the bay. It is one of the ordinary promenades of the town, and is good as far as the old fort. Beyond this it becomes bad for wheeled vehicles. Beyond the fortification the road follows the bay for over a mile, running close to the shore and ending at a quarry. Beyond this quarry a footpath continues through heavy brush to other quarries, concealed from the water. No boat landings should be attempted here. On either side of these quarries the brush is so dense that a man on foot can scarcely penetrate the thickets. The road, sunken and invisible from the bay, is completely protected from shot. The parapet of natural rock is brush covered, but could easily be cleared. In the rear the ground rises slightly, and is densely covered with brush.

The important point of Mt. Monserrat arises almost out of the city itself near its northwestern corner, and practically commands everything in the vicinity. Three of its sides are precipitous and the fourth is ascended only by a steep winding road, which is an extension of one of the city streets.

North and northwest of Matanzas are high hills where guns could be placed. The soil is scanty, but there is enough for fieldworks. South, and also along the southeastern shore of the bay, the hills are lower and more regular in outline.

Winding out of the city along the water front, is the Calzada de Buitrago, a fine street extending for several miles along the edge of the bay. This, however, soon becomes rocky as it nears the Bellamar caves. The road leading to Mt. Monserrat is not so rocky, but is far steeper and much narrower.

The only fort on the north or west shore of Matanzas Bay is a square work with four bastions called Castle San Severino, standing about 50 feet above sea level. The walls are of soft stone, some 4 or 5 feet thick. The work is ditched and surrounded by a wall about 6 feet high, which gives a place for infantry fire. The armament consists of two 8-inch Barrios M. L. R. (?) and six 24-pounder S. B. The place is worthless as a defense, except possibly against a boat attack landing on the western shore; but besides the guns enumerated, all of which might possibly give fire against an advance from the mouth of the bay, there are three embrasures now unoccupied, and an upper and lower parapet that might be used for infantry. The fort lies within a mile of the outskirts of the town, and the road leading to it is excellent. Should a landing be made on this shore it must be made within half a mile of this fort. No boat landing should be attempted farther out.

A sandy shore called La Playa extends around the south end of the Bay of Matanzas, upon which there are stretches of sandy beach favorable for boat landings. A good wagon road lined by houses follows the shore, but proceeding eastward of this the road soon grows bad. The beach comes to an end with the houses of the town, but the road continues through brushwood and over rocks. The quarries begin again and continue to and beyond a little bandbox fort situated close to the water and some 2 miles from the end of Matanzas Bay. Back of the low shore lie desolated brush-covered hills.

The battery of Peñas Altas is on the south shore of the bay, 2 miles east of the city, of masonry work, and mounts of four old-fashioned 24-pounders. Morillo Castle, also called Battery San Felipe, is situated on the southeastern shore of the harbor, at the mouth of the Canimar River. It has one 24-pounder and is used as a revenue station. Submarine mines need not be considered, except at the head of the bay. Recent reports state that earthen shore batteries have been lately thrown up about Matanzas, one near the lighthouse on the east side armed with 8-inch guns.

SAILING DIRECTIONS.

PORT MATANZAS.—The entrance to this port is open to the northward, and lies between Sabanilla and Maya Points, bearing ENE. and WSW. from each other, distant 2 miles. It is about 4 miles in length, with deep

water until nearly up to the shoals which shelter the anchorage. From Maya Point, which is low, with some huts on it, a rocky ledge extends about $1\frac{1}{2}$ miles to the northward; and on a narrow bank of soundings, on the west side of the ledge, temporary anchorage will be found.

The western coast at the entrance is bordered by a reef, which extends off from 200 to 500 yards. Within the port there are the detached shoals, New, Stony, and another.

Shoals.—According to the Government pilot, the middle of the harbor has many lumps or heads not shown on the charts. There is also less water at the head of the harbor than is shown on the chart.

Boats can either run into the San Juan River or alongside the dock, which runs to the northward from its mouth to the captain of the port's office. The market is $\frac{1}{2}$ mile up the San Juan River, convenient to boat landings.

Salutes can be returned.

The United States is represented by a consul and vice-consul.

Supplies.—Water for ship's use can be obtained up the river. It is also brought off in a water boat at one cent per gallon. It is strongly impregnated with lime.

Coal may be procured in moderate quantities from \$9 to \$10 per ton.

Freight is towed off to vessels in lighters.

Port charges are about the same as Habana.

Hospitals.—The government hospital is the largest; it has an efficient staff; sick mariners are admitted at a stipulated price. The private hospital is supported by the best and wealthiest people in the city, and is for their own sick; patrons pay \$5 per day. Sick mariners are charged \$2 per day.

Steamers.—Ward's line of steamers from New York frequently stop here, also tramps for sugar cargoes.

There is telegraphic communication with Habana and two mails daily from Habana by railroad.

Pilotage.—Compulsory, 8 cents per ton in and out.

Light.—It is intended to exhibit a light on Maya Point. The light is fixed white, visible 13 miles, and elevated 62 feet above the sea. The lighthouse is a cylindrical tower of iron, painted white. The keeper's dwelling is painted light yellow.

Anchorage.—The shoals are buoyed, but the buoys can not be depended upon. The shoals, however, as laid down on the chart can easily be avoided by a careful lookout and following the soundings as given on the charts. The bottom is stiff clay. But little difficulty will be experienced in picking out an anchorage, except in the sugar season, when the harbor may be more or less crowded; anchorage may be found in 10 fathoms outside of the reefs to the northward of Bajo Nuevo, the spot generally occupied by merchant steamers. It will be smoother, however, and more convenient to anchor inside Lajo Bank; and, as the latter is plainly visible at all times for its entire length, no trouble will be experienced in rounding either end, even if the buoys should be out of place.

Buoys.—Red conical buoys have been moored on the following shoals, which have been lately surveyed; on the reef north of Bajo Nuevo, north of Bajo La Laja, south of Bajo La Laja, on the Araña del Sur, and on the Araña del Norte.

A buoy, similar to the other ones, has been established on the south side of Stony Bank in 8 fathoms of water.

Winds.—The sea breeze is regular, but it is sometimes interrupted for a day or two by a fresh southwesterly breeze that finally hauls to the NW. and dies away, to be followed by the regular sea breeze. As the bay is open to the ENE., a heavy swell sets in with fresh trade winds. The Northerers, which frequently blow from September to February, interrupt the land breezes, and the departure of a sailing vessel may be hindered on this account.

Tides.—It is high water, full and change, at Port Matanzas at about 8 a. m. and 5 p. m. The stream runs in with the sea breeze and out with the land wind.

The rise and fall of tides is very small, except when there is a strong ENE. wind, when it attains a maximum of 4 feet.

Directions.—When bound to Matanzas, the peak of Matanzas, which overlooks it from the west, is an excellent guide; and about 12 miles eastward of the port, and 6 miles inland, there is a small ridge of remarkably irregular hills, of considerable elevation, but not nearly so high as the peak, with three distinct summits, called the Camarioca Paps. From the paps the land westward is level and not very low, without any remarkable object as far as the port, where it begins to rise gently, and can be seen 24 miles, continuing uniform to the peak of Matanzas.

Coming from the eastward, give Maya Point a berth of 2 miles until the port is well open; then steer to the SW., hauling up gradually for about a mid-channel course, taking care to avoid the bank of sand and rock which borders the point at a distance of 1,200 yards. Approaching from the westward, give the westward shore a berth of about $\frac{1}{4}$ mile. When San Severino Castle, a conspicuous object on the north shore of the port, bears S. 82° W. (S. 79° W. mag.), steer toward it until the fort of the Vigia, on the shore of the San Juan River, bears S. 54° W. (S. 51° W. mag.), then steer for it, passing northward of the buoy on the Stony Bank, and anchor in 5 or 6 fathoms water, mud, as the shipping will allow. As no reliance can be placed on the buoys, it may be advisable to take a pilot.

Canimar River is in the SE. part of the bay. On the western point of its entrance is the battery of San Felipe. The river is navigable for 9 miles from its mouth, having a depth of from 6 to 15 feet. On the bar at the entrance there are only from 6 to 9 feet, and a heavy sea breaks there during Northerers.

A number of small vessels load with fruit in this river for Habana and Matanzas.

The Pan de Matanzas can be seen from a distance of 36 to 40 miles. When seen from the NW. its summit forms three hummocks, the center one being much the highest, rising from behind a flat rocky ridge of land of moderate elevation. From the NE. it appears as a prominent rounded mountain, standing out by itself, and becomes a valuable point of departure. Should a vessel bound to Habana be found in a position thus far to windward or less, it will be better to stand in and run down within about 2 miles of the shore to avoid the current, taking care, however, to steer clear of the Jaruco Bank, on which there are only 11 feet of water and which lies about $1\frac{1}{4}$ miles from the shore, midway between Habana and Guanós Point, off the Iron Hills. The discolored water on this bank,

which is of some extent, may be seen from aloft in clear weather, and soundings appear to extend for a short distance all along the shore.

Several small streams empty into the sea between Habana and Guanós Point. Generally speaking, these rivers, excepting the Jaruco, can not be entered even by boats. The mouth of the Jaruco River is open to the north and only admits very small coasters.

5. AYUNTAMIENTO OF SANTA ANA.

Capital, Santa Ana.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Cidra	8	695 inhabitants. Matanzas R. R.

SANTA ANA is a town of 8,339 inhabitants (6,350 white and 1,989 colored) situated 7 miles from Matanzas. The nearest station is Cidra 3 miles away. Post office.

PROVINCE OF SANTA CLARA.

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PROVINCE OF SANTA CLARA.

LOCATION AND BOUNDARY.

This Province of Santa Clara occupies the center of the Island of Cuba, in a region known as Las Cinco Villas (the five towns). It received this name on account of the five towns founded within the limits by Diego Velazquez.

On the north it is bounded by the Straits of Florida, separating it from the sand banks of Bahama, on the east by the Province of Puerto Príncipe, on the south by the Caribbean Sea, and on the west by the Province of Matanzas.

AREA AND POPULATION.

Area, 8,773 square miles.

Population, 342,592. This province has 6 judicial districts (partidos judiciales) and 30 townships (ayuntamientos). These divisions comprise 6 cities, 2 towns, 9 farms, 170 villages, and a total of 17,000 urban estates.

ADMINISTRATION.

It is a third-class province, with a civil governorship, a naval and military command, administration of roads and communications and of finance. Provincial deputation, 28 *alcaldes municipales* (mayors), 3 vicars, and 42 parishes. It has a criminal court of justice, 6 courts of the first instance or of inquiry, and 28 municipal courts. The courts of the first instance are: Santa Clara, Sagua la Grande, San Juan de Remedios, Sancti Spíritus, Trinidad, and Cienfuegos. The municipal courts are: Santa Clara, Esperanza, Ranchuelo, San Diego del Valle, San Juan de las Yeras, Sagua la Grande, Amaro, Aja de Pablo, Calabazar, Quemado de Güines, Rancho Veloz, Santo Domingo, Remedios, Caibarien, Camajuani, Las Vueltas, Placetas, Caguajay, Sancti Spíritus, Trinidad,

Cienfuegos, Camarones, Cartagena, Las Cruces, Abrens, Palmira, Radas, and Santa Isabel de Las Lajas. The capital of the maritime district is Cienfuegos, situated on the southern coast.

PUBLIC INSTRUCTION.

The provincial collegiate institute numbers 345 students; 217 first municipal schools, with 6,917 pupils; 104 private schools, manual training schools, and a board of education in its principal cities.

AGRICULTURE, INDUSTRY, AND COMMERCE.

AGRICULTURE.—The Province of Santa Clara is one of the richest as well as one of the first settled parts of the island. It contains some of the largest sugar plantations and factories. Its rich soil yields in abundance all the special products of the Antilles and the fruits of the temperate zone thrive on the elevated slopes of its mountain ranges. It is rich, too, in minerals.

INDUSTRIES.—Its chief industries in common with the other provinces are the raising of sugar and tobacco and cultivation of fruits. Gold is extracted from the sandy shores of the Rio Arimao. Silver, copper, and asphalt are mined. Cattle are raised.

COMMERCE.—Its commerce consists in the importation and exportation of the above-mentioned products. This commerce is carried on by means of its fine ports on both the northern and southern coast.

GEOGRAPHY AND TOPOGRAPHY.

Santa Clara, with an area of 8,773 square miles, is 215 miles long from east to west, taking its most western boundary and the extreme eastern point of the peninsula of Zapata, and 80 miles wide from its extreme points north and south.

The territory of the Province of Santa Clara is divided into six judicial districts. Santa Clara, in the central part, with a population of 34,635; Cienfuegos, population 41,000, one of the most beautiful districts of the island; Sagua La Grande, in the north central part, through which the river of the same name flows, has a population of 23,740; Sancti Spíritus, situated in the east central part, has a population of 30,940; San Juan de los Remedios, situated in the northeastern part, has

a population of 15,550; and Trinidad, situated in the south central part, has a population of 27,000.

CITIES AND TOWNS.—The largest and most important of its towns are the capitals of these above-mentioned districts, each bearing the name of its district. Santa Clara is the capital of the province, and also capital of the district Santa Clara; its popular designation is Villa Clara, 248 miles from Habana, a population of 34,635, situated in the central part of the province. There is a gasoline mine a mile and a quarter from the city; gold, plumbago, and copper have been found there, and as much as 10,000 tons of asphaltum have been shipped from there in a single year.

Cienfuegos, capital of Cienfuegos Province, is situated on the fine harbor of Jague, population 26,700. Sagua La Grande, capital of the judicial district Sagua La Grande, is situated on the river Sagua La Grande, in the north central part, 260 miles from Habana, population 14,000. It is one of the most important cities on the island, and is connected by railway with Habana, Santa Clara, and Cienfuegos. Sancti Spíritus, capital of Sancti Spíritus judicial district, situated in the east central part, 55 miles distant from the city of Santa Clara, has a population of 17,540. San Juan de los Remedios, founded in 1545 on an islet or "Key," was afterwards removed somewhat farther inland from the northeastern coast. Its port is Cai-barién. It is 295 miles from Habana; population 7,230. Trinidad, situated a few miles from the port of Casilda on the south central coast, is the capital of the judicial district of Trinidad; population 13,500. It was the second city founded by the conqueror Velazquez.

LAKES.—The territory of this province is large and there are a great number of small lakes. Lake de Cayama is in the north central part; Lake Asiento Viejo, in the central part, a little to the north, is the source of the River Hanabana. There are a group of lakes in the central part, viz, Lakes Azul, Tunal, Guaniyal, Guanigua, de Cabo, del Termina, Redonda, and Viamanos, almost all of which are more or less adjacent and connected by small streams. Lake Charco Seiba is the source of the River Brazo de Viaha, which flows into the Embarcadero (port) Peralta. The Lake de Jibara is in the western part. Lake de las Obas is in the central part on the western boundary, near the River de la Hanabana. The lakes Cannas and Camito are two of a chain of four lakes, connected closely by small streams and situated midway between

the coast and the city of Santa Clara. In the central part there is the Lake Charco las Damas, but in the southern part there are but few lakes, with the exception of a cluster of lakes near the southern coast, called Salinas, which flows into the Estuary Nuevo or de las Guasimas, and the Lake de las Yanzas, to the west of this group. In the southern part there is the Aguado (port or place where ships go for water) de Barbera, and Aguado de Jaruco, just north of the city of El Jaruco, which is situated on the south central coast.

CREEKS.—On the Spanish maps the estuaries and the creeks bear the same name. The following creeks have their estuaries on the northern coast: Del Cedro, in the northwestern part of the coast; Capitán Tomás, a little farther west than the above-named creek; Playa Colorado and Del Ibaria, all east of the river Sagua la Grande; De la Gloria, just west of same river; Real, in the extreme northwestern part of the coast and a little to the west of the Río Jatibonico del Norte, which forms the boundary line of the province Santa Clara.

There are not so many on the southern coast. There is San Blas on the southern coast of the Bay of Cochinos; the creeks de las Tunas, del Infierno, and las Canoas are on the extreme southwestern coast.

CHANNELS.—There are the channels de los Barcos and del Pargo, off the northwestern shore of the province, separating two large cayos in the north. Opposite the river Sagua la Grande, off the northern coast, are the channels Alcatraces, Sagua Grande, and Maravillas. Off the south coast, also separating some cays, south of the Peninsula de la Zapata, are the large channels Filipinas and Canarreos.

ARCHIPELAGOES.—North of the entire northern coast is one immense archipelago filled with cays and shoals. Off the southern coast of the peninsula of this province is the archipelago Canarreos.

MOUNTAINS.—"The land in the interior of this province is gently undulating as in England," says Humboldt. The dominating peak of the central or Santa Clara mountain region is in the southern (San Juan) group, near the sea, not far from the town of Trinidad. It bears the name of El Pico del Potrillo, and has an altitude of about 3,000 feet. The range from this point passes slightly to the northwest and then curves around the south, forming the background to the

landlocked Bay of Cienfuegos, the ancient Xagua or Jagua. Near the meridian of Nipe the decrease in elevation is quite marked. Only here and there detached groups appear, one of which is the Sierra de Cubitas, immediately north of that city. This Cubitas range, always noted for its great caves, called the caverns of Cubitas, has recently come into historical prominence by reason of its selection as the seat of the insurgent government in 1896. The other remarkable caves in this province are those situated near the city of San José de los Remedios, and bear its name. The principal mountain ranges in the northern part of this province are the Sierra de Hato Nuevo or Santa Clara, which is situated not far from the northwestern coast, and south of the Bay of Santa Clara and the Sierra Morena, south of the city of same name, a few miles inland from the northwestern coast, south of the Bay of Obispo. The general topographical features of the lower part of this province are made up of a few mountain ranges interspersed with an infinite number of lomas (hills), and nestling down between which are innumerable small lakes and chains of lakes. The southwestern part of this province is an immense swamp or marsh filled with some cayos and a number of unhealthy, loathsome lakes.

RIVERS.

The Province of Santa Clara has its boundary line between it and Matanzas by the river Jatibonico, which empties into the Broa inlet. The Rio Sagua la Grande, which flows through the north central part of the province, is the largest river of the entire north coast of the island. It is about 90 miles in length and navigable for 20 miles from its mouth. It rises in the mountains south of the city of the same name, flows north into the sea east of Isabela. In this province there are also the Jatibonico del Sur, navigable for 6 or 8 miles; the Zaza, some 90 miles in length, which rises in the north central portion of the province and flows south; at its mouth is the port of Las Tunas; the Agabama, navigable for a short distance, and the San Juan, which waters the beautiful plains of Manicaragua and empties into the Bay of Jagua (Cienfuegos).

The rivers Sierra Morena, Carabatas, Sagua la Chica, Santo, Charco Honda, Aguas Nobles, Caibarién or Jiguibu, and Camboa are rivers not especially noteworthy and flow north and empty into the sea.

The rivers Guanarabo or Tayaba, Cabagan, Canas, Hongo, Yaguanabo, Arimo Salado, Hanabana, and Hatiguanico have their mouths on the southern coast.

Río Cruces rises near the boundary line between Matanzas and Santa Clara, flows north, and empties into the channel near Nosa Cays.

Río de Ay rises in the mountains of Tuerto, flows south, and empties into the sea east of the town of Casilda.

Río Damuji rises in the west central portion of the province, flows south, and empties into the Bay of Jagua.

Caunao rises in the central portion of the province, flows southwest, and empties into the Bay of Jagua.

CASCADES.—There are two important cascades in this province—the Hanabanilla, with an altitude of 430 feet, and Río Ay, with a fall of 178 feet. It is a part of the above Río de Ay.

COAST LINE.

North of the whole northern coast it may be said to be a continuous succession of cayos and small islands forming an immense archipelago, fortunately interspersed with four or five good channels. The coast proper, commencing at the northwestern boundaries, having the Bay of Santa Clara in the north and the Cayo de Cinco Leguas, is marked by an immense plain, called Sabana Anecadizas. Going eastward there is an endless succession of embarcaderos (landing places) and estuaries until the extreme northeastern coast is reached. To the north of this portion is the large Cayo Fragoso, which will be more fully described under the heading, "Reefs, Banks, and Cays."

The southern coast at its extreme southeastern part has a large shoal in which are located several cayos and one of the termini of the military trocha El Júcaro. From thence going eastward one encounters small inlets and coves until the mouth of the river Guaurabo. Between this latter point and the Bay of Jagua or Cienfuegos occurs this same succession of inlets, coves, and caletas (small creeks).

A little to the west of this Bay of Cienfuegos commences the celebrated Ciénaga de Zapata, which forms about 60 miles of the coast line of the Province of Santa Clara. Its Spanish name, Zapata, indicates its shape, that of a shoe. This marsh juts out into the sea in the form of a peninsula, forming on its north the Ensenada (inlet) de la Broa. This marsh is in-

dented by the Bay of Cochinos, which almost divides it into two parts, the eastern part being named Ciénaga Oriental de Zapata.

CAPES, POINTS, AND PENINSULAS.

Commencing on the northwestern coast, at the extreme west boundary line, is the point Unión. Following in succession, going east, there are the points Alvaro, Límones, Sierra Morena, Torbio, and La Salina Gesonia, at the mouth of the river Cruces. Point Obispo, which might be called a cape from its size, is north of the city Caibarién, which is situated on the coast. Point Judias, on the extreme northern boundary, lies north of the Sierra of the same name.

On the southern coast commencing at the Ciénaga Zapata, at its extreme western point, is the Point Gorda. At the entrance of the Bay of Cochinos is the Point del Padre. At the entrance of the Bay of Jagua or Cienfuegos is the Point Sabanilla. The Point Casilda is south of the city of Trinidad.

PENINSULA.—The Ciénaga of Zapata is almost divided into two parts by the Bay of Cochinos; the larger and western part is thus formed into a peninsula which juts out to the west along the entire coast of Matanzas.

REEFS, BANKS, CAYS, AND SHOALS.

Almedinas Reef, which always breaks, lies close to the edge of the bank, 3 miles from Anton Hill. Between the reef and Fragoso Cay there is a channel with $2\frac{1}{2}$ fathoms water.

From abreast Cay Frances the edge of the bank trends about NW. by W. for 40 miles, when it comes within a mile of the Jutias Cays; it then curves more westerly to the Boca of Marillanes.

Xagua Bank is of coral formation, 3 miles in length, east and west, and about 2 in breadth; at its NE. end there is a shoal patch with only 2 fathoms water on it. The northern edge of the bank is steep-to, shoaling suddenly from no bottom with 30 fathoms line to 12 fathoms, and then to 4 fathoms, which depth is near the shoal patch, making it at all times dangerous when approaching from the northward; whereas when nearing it from the southward the discolored water will not only be seen, but the soundings will decrease gradually from 17 to 9 fathoms, which is the least depth a vessel should stand into. The bottom is hard, and not good

holding ground. From the shoal patch, the peak of San Juan bears N. 49° E. (N. 45° E. mag.)

The cable steamer *Silvertown* obtained soundings of 22 fathoms, coral, sand, and broken shell, about $13\frac{1}{2}$ miles northwestward from the northwestern extremity of Paz Bank.

Position, latitude $21^{\circ} 28' 06''$ N., longitude $80^{\circ} 13' 12''$ W.

Paz Bank is pear shaped, 10 miles long in a WNW. and ESE. direction, and $3\frac{1}{2}$ miles wide at its broad end, which is to the eastward; this part is sandy, and in moderate weather a vessel may anchor on it. The general depth on the bank is from 12 to 20 fathoms, and towards the NW. end it is rocky.

CAY VERDE.—From Bushy Cay, the western point of entrance to the Boca Sagua la Grande, a chain of rocks, on which the sea breaks, encircles the cays as far as Cay Verde, $8\frac{1}{2}$ miles to the WNW. Near the edge of the bank, and $\frac{1}{2}$ mile north of Cay Verde, is a reef having an opening between it and another reef a mile farther westward, affording a passage for small vessels.

MÉDANO ISLET.—NW. by W. 6 miles from Cay Verde is a small, flat, sandy cay, from which the Nicolao Reef sweeps round from NE. to NW., distant from 1 to 3 miles, and on which the sea does not always break. About a mile SW. of it is a shoal which uncovers at low tide, and the sea always breaks over it. This part of the coast bank is extremely dangerous, and not well known. From Médano Islet, Cay Sal bears N. 7° W. (N. 10° W. mag.) 28 miles.

The northern edge of Nicolao Reef bears about N. 60° E. (N. 57° E. mag.) from Bahía de Cadiz lighthouse, or farther north than shown on the charts.

To the eastward of Bahía de Cadiz Cay, between it and Nicolao Reef, there is a clear space on the bank with from 6 to $2\frac{1}{2}$ fathoms water. Also, immediately eastward of the Médano, there is another clear space with about the same depth of water. A vessel under 10 feet draft may navigate over this part of the bank, with the lead and lookout for shallow water from aloft.

MOUNTAINS.—The following landmarks will be found useful in determining the ship's position: About 21 miles inland from the Nicolao Reef and the Médina Islet are the Sierras Morenas, extending NW. and SE. for a considerable distance and having several prominent peaks.

A little to the westward of the Sierras Morenas is a chain of mountains presenting three peaks called the La Bella Paps

the central one being the highest and bearing S. 23° W. (S. 20° W. mag.) of the Nicolao Reef. This peak bears directly south (S. 3° E. mag.) of Bahía de Cadiz Cay; consequently, when it is on that bearing a vessel will be to the westward of the Alcatraces and Nicolao reefs. S. 14° W. (S. 11° W. mag.), 6½ miles from Nicolao Reef, is the eastern extremity of the Alcatraces Cays, and 9 miles S. 42° W. (S. 39° W. mag.) of the Médano the western extremity. Between these cays and a chain named Falcones is the Boca de Alcatraces, where vessels of 9 feet draft will find shelter from all winds.

Fragoso Cay extends NW. 22 miles from Boca Chica at its east end, and presents nothing remarkable but a small hill in the middle, named Anton, which rises before the other land of the cay, which is low. The cay is divided by two narrow channels named Anton, but they are not navigable. On its NE. side is the Almedinas Reef, and another 2 miles NW. of the north point of the cay.

MEDIO AND PAJONAL CAYS.—About 2 miles WNW. of the west end of Fragoso Cay lies a low cay named Medio; and NW. of it are the Pajonal Cays. Between this group and Medio is the Boca de Marcos, navigable only for vessels under 5 feet draft. The Pajonal Cays extend about NW. for 4 miles to Tocinera Point, the north extreme of the group.

Jutias Cays are a group of several islets of moderate height, about 3 miles W. by N. of Vela Cay, and extend 4 miles westward. From the largest of them, three small, rather flat cays lie in a NE. direction over a space of 1½ miles, and from the outer one a broken reef extends westward 4 miles.

VELA AND CARENERO CAYS.—Three miles NW. of Tocinera Point lies a small, flat cay called Vela; about 2 miles to the southward of it is Carenero divided in two, and a mile westward of the latter is Lanzanillo, with a channel between.

Bonito, Cacao, and Palanca Cays, the most southern of this chain, are guides for vessels through the channel, which has not more than 10 feet of water, fine white sand, but there are scattered patches of rock easily seen, with less than 6 feet on them. The south side of the channel is here bounded by the north extreme of the Jardinillos Bank and the Rabihorcado Cay.

FÁBRICA AND CRISTÓBAL GROUPS.—Palanca Cay, which is rather more than 12½ miles WNW. of Flamenco Cap, is followed by the Fábrica Group, which connect themselves

with the shore to the NE. and form a channel with the chain of the Cristóbal Group westward of them.

JUAN LUÍS CAYS.—This part of the coast is known as the *sabanas*, or plains, of Juan Luís; and off it, at a distance of from 5 to 7 miles, is a chain of mangrove cays and sand banks of the same name. Vessels under 9 feet draft can pass between them and the coast, and also between them and the western cays of Cristóbal. About 4 miles NW. of Malahambre Cay is Gorda Point; the intervening land is marshy, covered with an herb called *masio*, and there are some palms a short distance inland. There are numerous channels for small vessels among the numerous cays along this coast and between them and the shore, but there are no leading marks which a stranger could recognize, nor does any intelligible and accurate information regarding them exist. The numerous large steamers running along the south coast of Cuba from Batabanó to Cienfuegos and Santiago de Cuba are all furnished with skillful pilots, but no general information can be procured from them respecting the navigation.

BLANCO CAY.—The shores of this cay, as its name imports, are formed of white rock and sand. It is a small low islet, 22 feet high, covered with trees and with a lagoon in its center. When seen from the southwestward this cay seems wedge-shaped, the higher part being to the southeastward. In case of having to wait for a pilot, as is probable, anchorage in $9\frac{1}{4}$ fathoms may be had with the city of Trinidad bearing N. 34° W. (N. 37° W. mag.) and Blanco Cay bearing N. 48° E. (N. 45° E. mag.) distant 1 mile. Before anchoring a clear spot should be selected.

If bound for Trinidad, after passing Zarza de Fuera Cay, instead of entering on the bank of soundings, steer about N. 23° W. (N. 26° W. mag.) and after sighting Machos de Fuera Cay, keep away N. 65° W. (N. 68° W. mag.) for Blanco Cay. When the Pan de Azucar is on with the Loma de Banao, Machos de Fuera Cay will bear north (N. 3° W. mag.). The knowledge of this fact may assist a stranger to recognize the land.

To seaward these reefs are steep-to, and 5 fathoms will be found close up to Blanco Cay, but a reef extends 600 yards from its western extremity, which may be safely rounded by the eye, and anchorage and good shelter found in 3 fathoms to the NW. of the cay. There is no safe opening westward, except for coasters drawing under 12 feet.

Cay Breton should be rounded carefully on account of a reef extending from it $3\frac{1}{2}$ miles to the SW. This reef is steep-to, and the sea generally breaks on it. Off the western end of the cay there is anchorage in $4\frac{1}{2}$ fathoms, with the NW. end of the cay bearing N. 42° E. (N. 39° E. mag.) and the SE. end, S. 81° E. (S. 84° E. mag.).

Sailing vessels generally have to beat up to this anchorage, and in this case, after rounding the western end of the reef, the NW. end of the cay should not be brought to the southward of S. 70° E. (S. 73° E. mag.), nor on the other tack should the same point be brought to the northward of N. 59° E. (N. 56° E. mag.). This anchorage is sheltered from N. by E. to SW.

This is the most dangerous part of the coast, and is seldom without a wreck upon it; for although the reef is awash, there is often but little break to show it, and the apparent termination of the cays induces strangers to haul close round, which at night is certain destruction. A vessel may haul round the extremity of the reef, and find good anchorage and shelter from all easterly and northerly winds; but in standing into a less depth than 4 fathoms keep a sharp lookout for rocky heads.

There is a passage through the reef to the NW. of Cay Breton with $2\frac{1}{2}$ fathoms in it, but it is crooked, narrow, rocky, and known only to a few of the Caiman fishermen, who navigate it by the eye. There is a powerful indraught toward this passage on the flood, which frequently takes command of vessels passing the reef end too closely, where they are liable to be becalmed, and obliged to anchor in an exposed position.

ZARZA DE FUERA CAY.—From Cay Breton the reef takes a NNW. direction for 23 miles, and terminates $\frac{1}{2}$ mile northward of Zarza de Fuera Cay, which is low, sandy, thickly wooded, and lies about 3 miles eastward of the NW. point of the reef, and about 8 miles from Zarza Point, the nearest part of the Cuba shore. The reef, without any cays upon it except an occasional dry patch of sand, is very steep-to in all parts, having 10 fathoms water alongside it, and 200 fathoms about a mile off; it trends from $\frac{1}{2}$ mile off the north side of the cay to about 4 miles eastward of it.

A vessel should pass 4 miles westward of Zarza de Fuera Cay, and when it bears S. 87° E. (east mag.) if wishing to enter upon the bank, the vessel may be hauled up NE., the edge of the bank being quite clear for 9 miles, or within 2

miles of Machos de Fuera Cay. After striking soundings, the water will shoal almost immediately to 5 fathoms, and then deepen to 6 and 9 fathoms, with occasional patches of 4 fathoms as the vessel advances along the channel, which is quite clear between the mainland and Zara de Fuera Cay and that of Médanos de Manati, which latter marks the north extreme of the shoals extending from near the Boca Grande. The Médanos are very inaccurately laid down on all charts; their position should be in about $21^{\circ} 27' N.$, long. $79^{\circ} 16' W.$, and the coast of the mainland is laid down about 7 miles too far south, at least as far east as Pasabanao Point.

This part of the coast affords good shelter and holding ground and is without danger as long as the beach is in sight. Abreast of the Doce Leguas Cays the coast is low and marshy, producing quantities of tobacco, honey, wax, and mahogany, exported in vessels of not more than 15 feet draft from Santa Cruz and the Jatibonico River, the mouth of which lies 30 miles to the northward of the Boca Grande.

There is an inside channel between the ports of Santa Cruz and Trinidad, which is smooth and well sheltered, with numerous excellent anchorages. The assistance of a pilot is, however, indispensable.

Bahía de Cadiz Cay is small and low, with some fishermen's huts and a flagstaff on its NE. point. To the westward is an anchorage sheltered from the usual NE. winds, but exposed to northerly winds. In hauling around the west end of the cay, vessels drawing not more than 15 feet may bring La Bella Paps to bear south ($S. 3^{\circ} E.$ mag.) or $S. 6^{\circ} E.$ ($S. 9^{\circ} E.$ mag.), and steer for them till the center of Bahía de Cadiz Cay bears $N. 77^{\circ} E.$ ($N. 74^{\circ} E.$ mag.), when the anchor may be let go in 4 fathoms of water; sandy bottom. Vessels drawing more than 15 feet should bring the same peaks to bear $S. 17^{\circ} E.$ ($S. 20^{\circ} E.$ mag.) till the center of the cay bears east ($N. 87^{\circ} E.$ mag.), then anchor in 5 fathoms. In standing in, the depths will be 4, $4\frac{1}{2}$, and 5 fathoms, with a dark-colored bottom, it being sand covered with weeds.

Supplies.—Wood and fish are easily procurable, but there is no water to be had.

Caution.—This part of the coast is little known, and inaccurately laid down on the charts.

Light.—Near the NE. end of Bahía de Cadiz Cay is an iron tower from which is shown, 175 feet above the sea, a fixed

and flashing white light, showing a flash every minute, and should be visible 20 miles.

Tides.—It is high water, full and change, at Cadiz Cay, at 9h. 20m., and the rise 3 feet.

BLANCO ZARZA CAY, lying $1\frac{1}{2}$ miles to the southward of Caney Point, is a small islet, with a lagoon in the center, covered with trees and having a white sandy beach. A few huts are on the eastern end, where, it is said, pilots may be procured. It is foul SW. for a mile, SE. $\frac{3}{4}$ mile, and NE. nearly a mile, leaving a passage between it and the shore $\frac{1}{2}$ mile wide, with a depth of 3 fathoms. The cay lies about 8 miles NNW. of Zarza de Fuera Cay, and between them the depth is from 6 to 10 fathoms; but near the edge of the bank there is an isolated spot with 4 fathoms, within which a vessel will find good anchorage.

The cay makes two channels, both of which appear to be easy to navigate. The one to the northward of the island is the better, the deepest water being midway between the island and the mainland. Boats sounding in this channel got no less than 3 fathoms, and information was obtained from the captain of the port and from the captains of trading vessels that this depth is carried by all who know the channel.

If pilots can not be obtained, strangers will find it advisable to send boats ahead to sound the channel.

Three miles N. 64° W. (N. 67° W. mag.) of Zarza Point is Caney Point, to the westward of which is a small creek with 6 feet water, and 6 miles farther to leeward is Ciego Point. In the bay between them there are from 3 to 5 fathoms water; and near the center is the Tallabacoa River, which has very little water in the dry season. Half a mile westward of Ciego Point is that of Iguañojo, with a ledge running off it for $\frac{1}{2}$ mile.

Water.—There is a brook of good water a little westward of the Tallabacoa River. It will also be found fresh, and fit for drinking, about 3 miles above the mouth of the Iguañojo.

TIERRA CAYS.—From the Iguañojo River the shore takes a WNW. direction 4 miles, and then turns abruptly to the southward for 2 miles to Agabama Point. From the latter a narrow ledge extends off 6 miles to the SE., leaving between it and the Iguañojo, on the opposite shore, a deep bight, called

San Pedro, in which there are from $3\frac{1}{2}$ to 6 fathoms water, clay bottom.

From Agabama Point the Tierra Cays extend out to the distance of $\frac{1}{2}$ mile; and $2\frac{1}{4}$ miles SSE. of these, and $2\frac{1}{2}$ miles from the edge of the ledge, is Machos de Fuera Cay, having a reef extending from 1 to 2 miles eastward of it. At Agabama Point the river of the same name runs into the sea, but the water is not good until 18 miles from its mouth. The coast from Agabama Point as far as Casilda Point is covered with mangroves, very low and swampy; and from the latter to Guaurabo Point (or River) is of sand and steep rock.

Shoal.—A shoal, with 17 feet water on it, lies on the following approximate bearings: Zarza de Fuera Cay S. 57° E. (S. 60° E. mag.), distant about 7 miles, and Blanco Zarza Cay N. 44° E. (N. 41° E. mag.) distant about $5\frac{1}{4}$ miles.

Soundings show $4\frac{1}{2}$, 4, 3, 3, and 3 fathoms and then 17 feet, after which the water deepens very rapidly and in a few casts no soundings. The shoal appeared to extend about 500 feet in the direction NW.—SE. by about 150 feet in width.

Reported shoal.—A pinnacle sunken rock, together with considerable shoal water, not indicated on the charts, has been reported about 9 miles southward from Xagua Bank. The depth of water on the shoal varies from 4 to 7 fathoms.

Position (to be considered doubtful), latitude $21^{\circ} 27' N.$, longitude $80^{\circ} 39' W.$

The principal bays are the following:

The Bay of Cochinos, south of the Peninsula of Zapata, almost separating the eastern and western part of the great swamp Ciénaga de Zapata; Bay of Jagua or Cienfuegos, indenting the south coast of the province and the Ensenada or Bay of Cazonos or Canarreos indenting the coast of the Peninsula of Zapata. There are two small bays, Obispo and Santa Clara; the northern boundary of the latter bay is formed by the Cayo de Cincos Leguas (the cay of five leagues).

Hernán Cortés, on the island of Bahía de Cadiz, and Faro Villa Nueva or Sabanilla lighthouses at the entrance to Cienfuegos Bay.

Anchoring places.—The harbors of Sagua la Grande, Tesico, and Caibarién in the north, and Zaza, Goleta, Masio, Casilda, Guaurabo, and Manati form the principal anchoring places.

RAILROADS.

The Province of Santa Clara has some 400 miles of trackage, distributed as follows:

1. From Cárdenas to Santa Clara, via Bemba, 107 miles, 40 of which are in Santa Clara Province; single track, standard gauge, belonging to the Ferrocarriles de Cárdenas-Júcaro; with two branches from Manacas, 12 and 13 miles respectively.
2. From Isabela, through Sagua, to Cruces, 54 miles, standard gauge, single track, belonging to the Ferrocarriles Sagua La Grande.
3. From Cienfuegos to Santa Clara, 43 miles, single track, standard gauge, belonging to the Ferrocarril Cienfuegos-Santa Clara; with the following spurs or branches:
 - a. Palmira to San Frances, 6 miles.
 - b. Nuevas to Cruces, 8 miles.
 - c. Ranchuelo to San Juan de los Yeros, 6 miles.
 - d. Ranchuelo to Concepción, 5 miles.
 - e. Cruces to Alegre, 10 miles.
4. From Caibarién to Cifuentes, 47 miles, standard gauge, single track, belonging to the Ferrocarriles Unidos de Caibarién.
5. From Palmira, via Rodas, to Cartagena, 29 miles, with branch from La Luz to Lequito, a distance of 3 miles.
6. From Caibarién, via Camajuani, to Placetas, 35 miles, single track, standard gauge.
7. From Caibarién to Placetas, 22 miles, with spurs as follows:
 - a. From near Bartolomé to Tobar, 14 miles.
 - b. From junction near Zulueta to Yera, 11 miles.
 - c. From Zulueta to Altamira, 5 miles.
8. From Sancti Spíritus to Tunas de Zaza, 22 miles, standard gauge, single track, belonging to the Ferrocarril de Sancti Spíritus.
9. From Casilda to Bijaba, 18.5 miles.
10. From Sagua la Grande northwest to Cayuagua, a spur 10 miles long.
11. From Cárdenas, via Ratamal, to Yaguaramas, standard gauge, single track, a distance of 67 miles.

1. CÁRDENAS, BEMBA AND SANTA CLARA RAILROAD (WITH TWO BRANCHES).

TABLE OF DISTANCES.

CÁRDENAS (Matanzas Province).

18	BEMBA (Matanzas Province).				
67	49	Boundary of Province, WEST.			
69	51	2	MORDAZO.		
78	60	11	9	MANACAS.	
83	65	16	14	5	S. DOMINGO.
92	74	25	23	14	9 JICOTEAS.
98	80	31	29	20	15 6 ESPERANZA.
107	89	40	38	29	24 15 9 SANTA CLARA (Santa Clara Province).

A branch from Manacas northwesterly to El Mamey, 12 miles, and a branch from Manacas northeasterly, 13 miles.

ITINERARY.

[For itinerary, see Cárdenas, Bemba and Santa Clara Railroad, in Province Matanzas.]

2. SAGUA LA GRANDE RAILWAY.

TABLE OF DISTANCES.

LA ISABELA (CONCHA).

13	SAGUA LA GRANDE.				
17	4	SITIECITO.			
26	13	9	RODRIGO.		
35	22	18	9	SANTO DOMINGO.	
42	29	25	16	7	SAN MARCO.
48	35	31	22	13	6 LAS LAJAS.
54	41	37	28	19	12 6 CRUCES.

ITINERARY LA ISABELA-CIENFUEGOS.

1. Santo Domingo-La Isabela (Concha).

Distances from
La Isabela.

- 49 k.—30.38 m. Between 49 and 48 kilometers, small *culvert*, *iron-girder bridge* 50 feet long over *stream*, then short *side track* and *platform* for sugar. Railroad ballasted with stone; one *telegraph line*, two wires. Country fairly level; crops largely corn; open, well-settled country, *excellent for march of troops*.
- 47 k.—29.14 m. About 47 kilometers, country more brushy; *good for troops*; railroad has single track.
- 46 k.—28.52 m. Same characteristics; corn and cane.
- 45 k.—27.90 m. Horses, cane and corn. A few low *cuts* along here, but thus far none above top of car; country fairly level.
- 44 k.—27.28 m. Flag *station*, sugar mill, and *small railroad*, probably sugar road, comes in from left. Much cane; country somewhat rolling; railroad same; some small grades, fairly level, though rough.

Enormous fields of cane; bananas; railroad here ascends considerable grade. Distances from
Isabella.

About 41 kilometers, small *side track* and *platform* for loading wood; more corn in this region than seen before; cattle. 43 k.—26.66 m.
41 k.—25.42 m.

About 40 kilometers, *water tank*. A low country, now more brushy; many cattle; *good for march of troops*; somewhat *sharp grades* but no cuts of consequence. 40 k.—24.80 m.

A little cultivation and grass; then small *bridge*, 15 feet long, and *station of Rodrigo*; *small station built of stone*; *two platforms* for loading; chiefly cane and molasses, as usual, in this region; two *side tracks*, flat cars for cane. Rodrigo is a town of some 200 inhabitants; environs rather flat and with low brush about; houses chiefly of wood and palm; down grade; going north the country roads are good, but are no doubt muddy in wet weather. 38 k.—23.56 m.

Country brushy and flat, with good grass; cattle; extensive meadows. 37 k.—22.94 m.

Great herds of cattle. 35 k.—21.70 m.

Meadows continue; frequent small *culverts* indicate water in wet season, although there is none to be seen now; many cattle. 34 k.—21.08 m.

Meadows, cattle, and horses; *wire fences* along railroad; country level and little fenced. 33 k.—20.46 m.

Great herds of cattle; country along railroad fairly level, but hills in distance; country in general somewhat brushy. 32 k.—19.84 m.

Cane again; railroad level, few cuts or grades. 31 k.—19.22 m.

Much cane and cattle; sugar mills; meadows. 30 k.—18.70 m.

Same; then *side track* to large ingenio on left; *platform and warehouse* here; then small *cut*, corn and cane fields, and another little *side track and warehouse*. 29 k.—17.98 m.

Corn and cane fields; a wooden *trestle* some 200 feet long and 8 to 10 feet high, with an *iron-girder bridge* in the middle about 40 feet long, over a little *stream*; low *cuts* here, and country grows more rolling; crops, corn and cane. 28 k.—17.36 m.

Cane; railroad curves here and somewhat sharp grade. 27 k.—16.74 m.

Cane; country now open and hilly; grades considerable, but *cuts* few and low; large sugar mill on right, close to track; much cane; open ground, hilly and beautiful. 25 k.—15.50 m.

A large *road* comes in from left; then *station of Sitiécito*. *Water tank*, *side tracks*, *wooden station*, and half dozen houses. This seems to be a junction. Much cane; country level in immediate vicinity of junction, but hills here and there far away. Just beyond station is an *iron girder bridge* 50 feet long over a good-sized river, probably unfordable; the bridge is on a *causeway* 150 feet long, with *brick piers*. Low, fine open country. 23 k.—14.26 m.

Wooden trestle 100 feet long, 10 feet high. Cattle and brush. 22 k.—13.64 m.

Country same; level along railroad; few cuts, none large. 21 k.—13.02 m.

Country more level, but slight grades; open meadows. 20 k.—12.50 m.

Distances from La Isabela. Same; road here fairly good, often running along track, but no doubt becomes bad in the wet season. *Country excellent*

19 k.—11.78 m. *thus far for troops.*

Many cattle; a queer old loopholed, battlemented tower (these towers are old ruins, built probably for protection against the pirates who formerly infested the Cuban coast), like that near Cienfuegos, near track; then cemetery, and road crosses a narrow-gauge track, passes a *water tank and many tracks*, and reaches *Sagua la Grande*. *Station of brick and stone, roomy and large, excellent place for landing. Platform of stone* shut in by iron fence. Much lumber at Sagua; *water tank* on road. Railroad continues to Boca, otherwise called *Concha (La Isabela)*.

On left country is low, flat, and open; town continues on right; then large ingenio near track on right.

16 k.—9.92 m. Country open, flat, and uncultivated; then siding; then crosses little *sugar road*.

15 k.—9.30 m. Country open, flat, and uncultivated on both sides; many cattle.

14 k.—8.68 m. Good dirt road continues along track, but evidently becomes muddy in wet season. *Country excellent for march of troops.*

13 k.—8.06 m. A little cultivation, and beyond, large ingenio and little sugar railroad.

12 k.—7.44 m. Country open and flat; meadows and many cattle; grass seems good. Dirt road continues on right of railroad. Country level

as a floor, open, with few or no fences, and those of wire; many horses and cattle; little or no cultivation.

A long but low *side track*, small *stock chute* near by cattle pens; many cattle. Here dirt road by track seems to end. Country open, quite level, with extensive meadows and many cattle; *excellent for march of troops*; a great cattle region.

Conditions the same; no cultivation; extensive meadows with cattle; level country; railroad straight as a bee line; road-bed ballasted with stone. Two lines of *telegraph* of two wires each.

Meadows extend across the country, which is now low and flat, covered with brush and marshy. *Troops could not move through this region, except on railroad embankment, which could be used by wagons, horses, and foot troops.* It would only be necessary to march about 4 to 4½ kilometers in this way.

Low, bushy marsh, and then arrive at *La Boca (La Isabela)*, officially called *Concha*.

2. Santo Domingo-Villa Clara (Cruces).

The town of *Santo Domingo* lies about 50 kilometers from Concha Station, the seaport of Sagua la Grande. The town seems a mile or so beyond the intersection of the Cárdenas and Júcaro and Sagua la Grande roads. At the *junction* is a *stone station house*.

Country level, somewhat brushy, growing corn, a little cane, bananas, garden truck, and some tobacco. Road single track, cars better than on Cárdenas and Júcaro Railroad; one line of telegraph, two wires. Country ceases to be cultivated shortly after leaving station. Distances from La Isabela.

Country level, somewhat brushy, with palms; sandy soil, more like the Vuelta Abajo, and *excellent for the march of troops*. 51 k.—31.62 m.

Country slightly more brushy. Otherwise the same. 53 k.—32.86 m.

Country level, fairly open, no cultivation, no fences, no huts nor houses, many palms. Railroad thus far has passed several *stone culverts*, but no bridges and no towns. There is *little water* here, but it is probably plentiful in the wet season. 55 k.—34.10 m.

About 59 kilometers, one *side track and station of San Marcos*; *wooden station house, wooden loading platform, water tank*, houses of wood, population about 100, country flat. 57 k.—35.34 m.

Beyond San Marcos, country same, little cultivation, a few huts, country flat and open, with palms and woods. 59 k.—36.58 m.

Near 62 kilometers, a *small culvert*; a *bridge* 30 feet long. Country more cultivated; cane. 60 k.—37.20 m.

Country open and cultivated; cane and more corn. A railroad comes in from the right; then two or three houses and a little *station*; no side track, but there is a "Y," a platform and a *stock chute*. Thus far the *country along the railroad has been excellent for the march of troops*. Here at 63 kilometers there is a fine, open, sugar country to the right, and to the left more brush and less cultivation. Then to the right extend great meadows, with cattle and horses; flat, cane-growing country; ingenio roadbed good, stone ballast. 62 k.—38.44 m.

Road fairly level; dirt ballast; a few low cuts; country somewhat brushy here and there. 63 k.—39.06 m.

Cane fields; cattle; stone ballast again; country good for march of troops. 65 k.—40.30 m.

A *side track and platform* for sugar; a few huts, then a little *bridge* 40 feet high, 20 feet long. Country now more rolling. 66 k.—40.92 m.

Bridge, 20 feet long, 30 feet high, over small stream; cuts more frequent, but low and through rock; then *embankment* and a little *wooden bridge*, 10 feet long, on *stone abutments*. 67 k.—41.54 m.

Town of Lajas; road descends for a mile or two before reaching town. Lajas is a clean, pleasant-looking place, with frame or stone houses, a *side track, little stone station house, water tank, storehouse, and platform* for loading cane and molasses. The town is surrounded by bananas, palms, brush, etc., the ground being somewhat rolling. Population probably several thousand. As at Santo Domingo, there does not seem to be any very strong position near the town. Beyond, the country is open, slightly rolling, *good for marching*, and cultivated; cane; more corn than before; also large meadows and much stock. 68 k.—42.16 m.

70 k.—43.40 m.

- Distances from La Isabela. Road becomes very bad and dangerous in places on account of old rails; much cane, a few small *cuts and embankments*.
 71 k.—44.02 m. A rich region, with much cane and cattle.
- 73 k.—45.26 m. At about 73 kilometers are a few houses, and roads from right and left, probably for sugar.
- 74 k.—45.88 m. Single track, a *low cut through rock*, much cane, ground generally level, no hills in sight; in fact, few or none are seen after leaving the vicinity of Coliseo.
- 75 k.—46.50 m. Much cane; country slightly rolling, cattle and brush, probably old sugar fields; here and there palms and a few other trees.
- 76 k.—47.12 m. A few fences, enormous sugar mills; horses and mules; there seems to be plenty of water here even in winter; a road frequently runs along railroad; it gives indication of being muddy in the wet season, but is good now, as are all in Cuba at this season (January).
- 77 k.—47.74 m. Great meadows, brushy on right; town of *Las Cruces* lies a mile beyond on left. Hills now lie far in front, approaching nearer on right.
- 78 k.—48.36 m. At about 78 kilometers is a curve and a narrow-gauge railroad to the right; then a *switch and branch road of Sagua system*. Station, and many tracks and cars. Las Cruces has *frame station*, is junction of Sagua la Grande Railroad with the Santa Clara and Cienfuegos Railroad. Trains of both lines enter the same station; a *platform* lies between two tracks. The town of Cruces lies 31 kilometers by rail from Cienfuegos, and numbers probably several thousand inhabitants. The surrounding country is flat, and there is no strong position near by. The people of this region are called the Yankees of Cuba; they are active, energetic, and prosperous. Country flat, *two low flat hills near station*, say a mile distant, which could be *fortified and command junction*. At Cruces many side tracks, switches, etc.; much movement about the place; people, horses, cattle, oxen, and great carts for sugar and molasses. In this region everything is sugar.

3. SANTA CLARA AND CIENFUEGOS RAILWAY

TABLE OF DISTANCES.

SANTA CLARA.

10	ESPERANZA.				
16	6	RANCHUELO.			
25	15	9	CRUCES.		
28	18	12	3	CAMARONES.	
35	25	19	10	7	PALMIRA.
43	33	27	18	15	8 CIENFUEGOS.

ITINERARY.

From Santa Clara this road runs westward over the Cárdenas-Bemba-Santa Clara Railroad to Esperanza, through a level, fertile region thickly populated and well cultivated. Distances from Santa Clara.

12 miles.

From here the road turns to the southward, and after crossing a rolling region passing through Ranchuelo, where a small spur runs to San Juan de los Yeras, 6 miles distant, the road continues to the town of Cruces, where it makes connections for Sagua La Grande, Cárdenas, etc. It has a small branch from here to Alegre, 10 miles. 20 miles.

33 miles.

Beyond Cruces the country becomes somewhat broken and rough, and just before entering Palmira the road crosses a small grade and enters the town of Palmira, where a small branch extends some 6 miles to S. Franco. 46 miles.

Leaving Palmira a rock cut some 20 feet long, high and curved, is encountered. Country now becomes more hilly and brushy; much cultivation, many houses, cuts grow deeper, and many small embankments are passed. Just before entering its terminus the road crosses a small iron bridge, and then enters Cienfuegos, its terminus. 55 miles.

4. CAIBARIÉN-CIFUENTES RAILWAY.

TABLE OF DISTANCES.

CAIBARIÉN.

6	REMEDIOS.									
13	7	TAGUAYABON.								
16	10	3	VEGAS DE PALMA.							
19	13	6	3	CAMAJUANÍ.						
21	15	8	5	2	BOSQUE.					
22	16	9	6	3	1	QUINTA.				
26	20	13	10	7	5	4	VEGA ALTA.			
32	26	19	16	13	11	10	6	ENCRUCIJADA.		
39	33	26	23	20	18	17	13	7	MATA.	
47	41	34	31	28	26	25	21	15	8	CIFUENTES.

ITINERARY.

Leaving Caibarién this road runs southwestward from the coast over a low flat country and enters the city of Remedios. Distances from Caibarién.

6 miles.

Beyond, the country is more rolling, and on the right a range of hills is seen. Country more populated and cultivated. Road enters Taguayabon, 7 miles from Remedios. 13 miles.

From here it traverses a rough rolling country and reaches the village of Camajuani. 19 miles.

Here the road crosses a wild broken region, thinly populated and little cultivated, passing the hamlets of Bosque and La Quinta and thence to the village of Vega Alta. 22 miles.

24 miles.

28 miles.

Farther on it enters the village of Encrucijada. 34 miles.

Distance from Caibarién. 48 miles. From here until it reaches its destination, Cifuentes, 48 miles from Caibarién, the road traverses a rough, hilly country. Few signs of habitation or civilization are seen. On the right of the track is a long range of hills which disappear just before the road reaches its terminus.

5. PALMIRA, RODAS AND CARTAGENA RAILWAY.

TABLE OF DISTANCES.

PALMIRA.

6	MONTERO.			
13	7	CONGOJAS.		
17	11	4	RODAS.	
24	18	11	7	LA LUZ.
29	23	16	12	5 CARTAGENA.

ITINERARY.

This line seems to be a system of short local roads connecting the sugar plantation with the main line of the Santa Clara road, where it has an outlet to the ocean, via Isabela Cruces Railroad. It is only of local importance.

6. CAIBARIÉN AND SANCTI SPIRITUS RAILWAY.

TABLE OF DISTANCES.

CAIBARIÉN.

6	REMEDIOS.			
13	7	TAGUAYABON.		
17	11	4	VEGAS DE PALMA.	
19	13	6	2	CAMAJUANI
22	16	9	5	3 SALAMANCA.
29	23	16	12	10 7 SAN ANDRÉS.
35	29	22	18	16 13 6 PLACETAS.

ITINERARY.

For itinerary see Caibarién-Cifuentes Railroad as far as Camajuani. From here the railroad runs in a southeasterly direction through a rough and undulating region via Salamanca and San Andrés to Placetas. This standard-gauge railroad forms a triangle with the narrow-gauge railroad from Caibarién to Placetas, Caibarién, Camajuani, and Placetas being points of this triangle.

7. ZAZA RAILROAD.

TABLE OF DISTANCES.

CAIBARIÉN.

4	ROJAS.				
8	4	S. BARTOLOMÉ (JUNCTION).			
10	6	2	PÉREZ.		
11	7	3	1	JUNCTION.	
13	9	5	3	2	ZULUETA.
22	18	14	12	11	9 PLACETAS.

ITINERARY.

This line is a private road, single track, narrow gauge.

Leaving Caibarién, where it connects with the Caibarién and Cifuentes Railroad, this road traverses to the southward a level fertile region and enters the station of *Bartolomé* (where a branch runs in a southerly and easterly direction via Vuñas, 4 miles; to Tobar, 14 miles, and to Pérez, 10 miles).

Beyond here the country is rough and hilly, thinly populated, and little cultivated. Eleven miles from Caibarién, a spur track, 11 miles long, runs in a southerly and easterly direction to Yera.

At Zulueta a spur, 5 miles long, runs in a westerly direction to Altamira.

From Zulueta to Placetatas, the terminus, is 9 miles.

Distances from
Caibarién.
8 miles.

8 miles.

13 miles.

22 miles.

8. SANCTI SPÍRITUS RAILWAY.

TABLE OF DISTANCES.

TUNAS DE ZAZA.

6	ZAZA.				
10	4	CIEGO.			
11	5	1	GUASIMAL.		
13	7	3	2	CASARIEGO.	
16	10	6	5	3	PERADES.
18	12	8	7	5	2 JARAO.
19	13	9	8	6	3 1 LAS MINAS.
20	14	10	9	7	4 2 1 EL CAPRICHO.
22	16	12	11	9	6 4 3 2 SANCTI SPÍRITUS.

ITINERARY.

This road is a local line connecting the city of Sancti Spíritus with the seacoast.

Leaving Sancti Spíritus it encounters a ridge just at the edge of the town, which it crosses over, and then enters a level fertile region which gradually grows lower as the coast

Distances from Sancti Spiritus. is approached. The country is well cultivated, and fine plantations may be seen from either side of the car. The hamlets of Paredes and Guasimal are passed, and then the road enters the coast town of Tunas, its terminus, 27 miles from Sancti Spiritus.

10 miles.
16 miles.
27 miles.

9. CASILDA-BIJABA RAILWAY.

TABLE OF DISTANCES.

CASILDA.					
3.5	TRINIDAD.				
9.5	6	ILLAS.			
12	8.5	2.5	MANACAS.		
18.5	15	9	6.5	FERNÁNDEZ.	

ITINERARY.

Distances from Bijaba. This is a local line running from Casilda, on the coast, via Illas and Manacas to Fernández, a distance of 18.5 miles. Its only importance is in connecting the city of Trinidad with the coast. From Fernández to Trinidad it traverses a valley; on the right are the mountains, and on the left a range of low hills. Trinidad is reached at a distance of 15 miles.

12 miles.

From here it passes through a level low country to the coast town of Casilda.

17 miles.

11. CÁRDENAS, JÚCARO, AND YAGUARAMAS.

TABLE OF DISTANCES.

CÁRDENAS.					
28	RATAMAL. } PROVINCE OF MATANZAS.				
50	22	BOUNDARY OF PROVINCE, WEST.			
53	25	3	JAGUEY.		
56	28	6	3	AGUADA.	
63	35	13	10	7	CAMPIÑA.
67	39	17	14	11	4 YAGUARAMAS.

[For itinerary, see Cárdenas, Júcaro and Yaguaramas Railroad, in Province of Matanzas.]

ROADS.

This province has a great many good roads and pikes, the principal ones being:

1. From Santa Clara to Alvarez, 47 miles, page 353.
2. From Santa Clara to Sagua La Grande and Isabela, 44 miles, page 354.
3. From Santa Clara to Trinidad and Casilda, 65 miles, page 354.

4. From Santa Clara to Remedios, 51 miles, page 355.
5. From Sancti Spíritus to Remedios, 53 miles, page 356.
6. From Remedios to Morón, 75 miles, of which 47 miles are in the Province of Santa Clara, page 356.
7. From Puerto Príncipe to Santa Clara, 184 miles, of which 84 miles are in the Province of Santa Clara, page 357.
8. From Sancti Spíritus, via Cienfuegos and Guinia Miranda to Venero San Juan, 117 miles, page 357.
9. From Cienfuegos, via Zaza, to Sancti Spíritus, 98 miles; and branch from Zaza to Tunas de Zaza, 6 miles, page 358.
10. From Cienfuegos, via Los Abreus, to Yaguaramas, 27 miles, page 358.

1. SANTA CLARA-ÁLVAREZ ROAD.

TABLE OF DISTANCES.

SANTA CLARA.					
10	ESPERANZA.				
26	16	S. DOMINGO.			
41	31	15	JIQUEABO.		
47	37	21	6	ÁLVAREZ.	

ITINERARY.

Leaving Santa Clara the road runs north of west, traversing a comparatively level country whose soil is fertile and much cultivated. To the left in the distance may be seen a number of knolls. Many little streams and creeks are crossed. Plantations are scattered here and there until a few huts, called Anton Diaz, is reached. Distances from Santa Clara.
2 miles.

Here the road turns sharply to the north and enters the town of Esperanza, crossing the railway tracks just before reaching the city limits. 10 miles.

Beyond the town the road crosses a vast rolling plain with numerous streams scattered over the territory. Now and then bluffs may be seen to the right in the distance. Numerous plantations are passed and the land shows much cultivation. The road finally enters the city of Santo Domingo from the south, crossing the railway tracks at the edge of the city. 26 miles.

Leaving Santo Domingo the road crosses a vast plain of level country dotted here and there with creeks and bayous. The land is fertile and much cultivated. About 6 miles from the city the road turns west, and traversing a region similar to that just described enters the town of Jiquiabo. 41 miles.

From here the road traverses an uncultivated, uninhabited country—a vast waste of prairie—and finally enters the town of Alvarez, at a distance of 52 miles from Santa Clara. The road here divides, one branch communicating with Motemba 47 miles.

to the northwest, one to Colón, and another to Palmira on the south. These branches are not considered of sufficient importance to describe, save that the Motemba branch connects with the road from that place to Matanzas.

2. SANTA CLARA-SAGUA LA GRANDE ROAD.

TABLE OF DISTANCES.

SANTA CLARA.

19	CIFUENTES.				
22	3	SITIO GRANDE.			
28	9	6	GUATA.		
31	12	9	3	SAGUA LA GRANDE.	
44	25	22	16	13	ISABELA.

ITINERARY.

Leaving Santa Clara the road runs north over an undulating, well-watered, and fertile country, past numerous plantations and across little streams, for a distance of about 10 miles. Here it encounters a hilly country for a short distance, then enters a region thinly populated and little cultivated. Shortly before reaching the village of Cifuentes the road skirts along the base of a high knoll and then enters the town of Cifuentes at a distance of 20 miles from its beginning.

Distances from
Santa Clara.

10 miles.

19 miles.

From here until the town of Sitio Grande is reached the road runs through an undulating plain, but little cultivated or inhabited.

22 miles.

Running parallel with the railroad, from Sitio Grande the road traverses a somewhat lower country and many streams and creeks are forded. The country is more populated and cultivated than that heretofore described. Just before reaching the Río Sagua the road turns and follows it for some distance past the village of Guatá, finally crossing it, however, and enters the town of Sagua La Grande.

28 miles.

31 miles.

Leaving here, the road runs between the river and railroad track, over a flat, low country, until it enters the seaport of Isabela, situated 50 miles from Santa Clara.

44 miles.

3. SANTA CLARA, TRINIDAD, AND CASILDA ROAD.

TABLE OF DISTANCES.

SANTA CLARA.

29	GÜINIA MIRANDA.				
36	7	CAYAGUANI.			
49	20	13	EL CONDADO.		
51	22	15	2	RIO DE AY.	
61	32	25	12	10	TRINIDAD.
65	36	29	16	14	4 CASILDA.

ITINERARY.

Leaving Santa Clara in a southerly direction over a comparatively level country, the road soon reaches a rougher country of hills and mountains, skirting along a narrow pass between two ranges of hills, and soon reaching a more open country until it encounters a large hill at a distance of 16 miles from Santa Clara. Ascending this, the road becomes very rough as it passes through the mountains. Habitations are few and the land sterile and little cultivated until a small valley, surrounded on all sides by high mountains, is reached, where the land becomes more fertile and productive. At the farther end of the valley lies the village of Güinia Miranda.

From here the road runs through deep gorges and over rough hills to the river town of Cayaguani.

Beyond here the road follows along the Agabama river banks, first on one side and then the other side of the stream, past the hamlet of San Francisco to the village of El Condado. Here it meets the Trinidad Railway.

From here it leaves the river and traverses a fertile valley region through the village of Río de Ay, and continues over a picturesque, fertile valley, gradually approaching a range of mountains. Passing along the foot of these in gentle curves, it soon reaches the railway again. Following parallel to it the road finally enters the city of Trinidad.

The road extends from Trinidad to the seaport of Casilda 3 miles farther on.

Distances from
Santa Clara.

16 miles.

39 miles.

36 miles.

49 miles.

51 miles.

61 miles.

65 miles.

4. SANTA CLARA-REMEDIOS ROAD.

TABLE OF DISTANCES.

SANTA CLARA.

13	SANTA FÉ.		
19	6	CAMAJUANI.	
24	11	5	TAGUAYABON.
32	19	13	8 REMEDIOS.

ITINERARY.

Leaving Santa Clara this road travels east. For a distance of about 5 miles the country is a level plain. Here it crosses a little creek and, skirting along the base of a hill, enters a more rolling and rougher country. Crossing over quite a stream at the hamlet of Santa Fé it ascends some tall hills; descending again into a pretty valley it enters the village of Camajuani, crossing the railway tracks at the outskirts of the town.

Beyond here the road runs parallel to the railway through a fertile rolling plain to the hamlet of Taguayabon.

From here the road soon reaches a range of hills, over which it crosses, and descends into the valley and enters the city of Remedios, 32 miles from Santa Clara.

Distances from
Santa Clara.
5 miles.

13 miles.

19 miles.

24 miles.

32 miles.

5. SANCTI SPIRITUS-REMEDIOS ROAD.

TABLE OF DISTANCES.

SANCTI SPIRITUS.

11	CABAIGUAN.				
34	23	PLACETAS.			
40	29	6	JAGUEY.		
44	33	10	4	GUADALUPE.	
51	40	17	11	7	REMEDIOS.

ITINERARY.

Distances from
Sancti Spiritus.

Leaving Sancti Spiritus the road skirts along the edge of a hill overlooking the city and enters a level plain for a short distance. It soon passes between two hills, and, running through a highly cultivated valley, enters the village of Cabaiguan.

11 miles.

From here the road crosses a level fertile region, though little inhabited and cultivated; now and then small creeks or streams are crossed, but, on the whole, the country is a desolate, dreary waste of land. Shortly before reaching the town of Placetas a small range of hills is passed, after which the road enters the town of Placetas, at a distance of 34 miles from Sancti Spiritus.

34 miles.

Beyond this the country becomes rough and broken, and the road soon crosses the railway tracks and enters the hamlet of Jaguey.

40 miles.

From here the road traverses a more level country, winding around the foot of a range of bluffs on its left, and enters the town of Guadalupe.

44 miles.

Shortly after leaving the town the range on its left disappears, and the road approaches a ridge on its right, which it follows until the city of Remedios is reached, at 51 miles.

51 miles.

6. REMEDIOS-MORÓN ROAD

TABLE OF DISTANCES.

REMEDIOS.

3	BARTOLOMÉ.				
10	7	BUENAVISTA.			
29	26	19	MENESES.		
51	48	41	22	CHAMBAS.	} PUERTO PRÍNCIPE PROVINCE.
76	72	65	46	24	
MORON.					

ITINERARY.

Leaving the city of Remedios the road skirts along a ridge of hills on its right, with a broad, open plain on its left, and soon reaches the village of Bartolomé, where it leaves the hills for quite a distance and traverses a somewhat undulating region until the village of Buenavista is reached.

Beyond here the road traverses an undulating country, gradually approaching a narrow valley between two ranges of mountains, through which it passes until the hamlet of Meneses is reached.

From here the road continues up the valley until it reaches its head. Here it turns to the left and enters a narrow pass, but soon emerges again into a broad, open plain, leaving the range of mountains on its right, and passes on to the town of Chambas.

Beyond the town the road enters a more level country, gradually leaving the mountains in the distance, and passing through a very fertile, well watered, inhabited, and cultivated region, at last enters the city of Morón, at a distance of 75 miles from Remedios.

Distances from Remedios.

3 miles.

10 miles.

29 miles.

51 miles.

75 miles.

7. PUERTO PRÍNCIPE-SANTA CLARA ROAD.

[For Table of Distances and Itinerary, see Road 2, Puerto Príncipe to Sancti Spíritus, Province of Puerto Príncipe, page 402.]

8. SANCTI SPÍRITUS, CIENFUEGOS, GÜINIA MIRANDA, AND VENERO SAN JUAN ROAD.

TABLE OF DISTANCES.

SANCTI SPÍRITUS.

24	EL JUMENTO.									
35	11	GÜINIA MIRANDA.								
48	24	13	MANICARAGUA LA VEGA.							
52	28	18	5	MANICARAGUA MOZA.						
64	40	29	16	11	CUMANAYAGUA.					
72	48	37	24	19	8	SAN ANTON.				
85	61	50	37	32	21	13	CIENFUEGOS.			
92	68	57	44	39	28	20	7	TRUJILLO.		
102	78	67	54	49	38	30	17	10	RODAS.	
117	93	82	69	64	53	45	32	25	15	VENERO SAN JUAN.

9. CIENFUEGOS, ZAZA, AND SANCTI SPIRITUS ROAD.

TABLE OF DISTANCES.

CIENFUEGOS.

12	A. ARIMAO.	
19	7	GAVILAN.
34	22	15 MUÑOZ.
40	28	21 6 GUANAJARA.
45	33	26 11 5 TRINIDAD.
52	40	33 18 12 7 YAGUANA.
56	44	37 22 16 11 4 BARRO.
60	48	41 26 20 15 8 4 PEDRO.
77	65	58 43 37 32 25 21 17 ZAZA.
83	71	64 49 43 38 31 27 23 6 GUASIMAL.
91	79	72 57 51 46 39 35 31 11 5 PAREDES.
94	82	75 60 54 49 42 38 34 17 11 6 JARAO.
98	86	79 64 58 53 46 42 38 21 15 10 4 SANCTI SPIRITUS.

10. CIENFUEGOS, LOS ABREUS, AND YAGUARAMAS ROAD.

TABLE OF DISTANCES.

CIENFUEGOS.

5	TRUJILLO.	
16	11	LOS ABREUS.
27	22	11 YAGUARAMAS.

JUDICIAL DISTRICTS, TOWNSHIPS, CITIES, AND TOWNS.

Judicial districts (partidos judiciales).	Townships (ayuntamientos).
Cienfuegos	{ Abreus (Los). Camarones. Cartagena. Cienfuegos. Las Cruces. Palmira. Rodas. Santa Isabel de Las Lajas.
Sagua La Grande	{ Amaro. Calabazar. Ceja de Pablo. Quemados de Güines. Rancho Veloz. Sagua La Grande. Santo Domingo.
Sancti Spiritus	Sancti Spiritus.
San Juan de los Remedios	{ Buena Vista. Caibarién. Camajuani. Placetas. San Antonio de las Vueltas. San Juan de los Remedios. Yaguajay. Zulueta.
Santa Clara	{ Esperanza (La). Ranchuelo. San Diego del Valle. San Juan de las Yeras. Santa Clara.
Trinidad	Trinidad.

I. JUDICIAL DISTRICT OF CIENFUEGOS.

Townships.	Population.
1. Abreus (Los)	7,602
2. Camarones	8,555
3. Cartagena	8,915
4. Cienfuegos	
5. Las Cruces	8,527
6. Palmira	4,995
7. Rodas	8,709
8. Santa Isabel de las Lajas	9,104

1. AYUNTAMIENTO OF ABREUS (Los).

ABREUS (Los) is a town of 4,503 inhabitants, situated $7\frac{1}{4}$ miles from Cienfuegos and 1 mile from the station of Barca del Río Damuji. It has a horse car line. Post office and telegraph station.

2. AYUNTAMIENTO OF CAMARONES.

Capital, Camarones.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Ciego Alonso	5	
2. Lomas Grandes	8	
3. Paradero	8	

CAMARONES is a town of 1,200 inhabitants, situated $15\frac{1}{4}$ miles from Cienfuegos. Cienfuegos Railroad, post office, and telegraph station.

3. AYUNTAMIENTO OF CARTAGENA.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Arriete	$5\frac{1}{4}$	On railroad to Cienfuegos.
2. Cascajal	$16\frac{1}{4}$	On Cárdenas and Júcaro R. R.
3. Ciego Montero	$5\frac{1}{4}$	Nearest station Arriete.
4. Santiago	6	
5. Soledad	$8\frac{1}{4}$	

CARTAGENA is a town of 1,497 inhabitants, situated on the branch railroad to Rodas, 20 miles north of Cienfuegos, near the river Damuji. Post office and telegraph station.

4. AYUNTAMIENTO OF CIENFUEGOS.

Capital, Cienfuegos.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Aguada de Pasajeros.....	25	Cárdenas and Júcaro Railroad.
2. Arango.....	15½	
3. Arimao.....	15½	2,404 inhabitants.
4. Auras.....	9½	362 inhabitants.
5. Cabeza de Toro.....	17½	
6. Caimanera.....	8½	1,093 inhabitants.
7. Calabazas.....	2½	
8. Calisito.....	8½	
9. Camarones.....	13	
10. Castillo de Jagua.....	6	271 inhabitants.
11. Caunao.....	4½	1,583 inhabitants.
12. Corralillos.....	10½	
13. Cumanayagua (Santa Cruz de).	18½	Port of 742 inhabitants.
14. Charcas.....	8½	
15. Gavilan.....	18½	
16. Gavilancito.....	18½	
17. Grietas.....	18½	
18. Guasimal.....	13	
19. Jabacoa.....	18½	
20. Jicotea.....	8½	
21. Junco.....	3	
22. Lomas Grandes.....	13	
23. Mancas.....	3	1,230 inhabitants.
24. Mandiuga.....	18½	518 inhabitants.
25. Ojo de Agua.....	18½	421 inhabitants.
26. Palmira.....	8½	
27. Ramirez.....	8½	1,432 inhabitants.
28. Sierra (La).....	18½	558 inhabitants.
29. Yaguaramas.....	18½	Port of 1,071 inhabitants, on Cárdenas and Júcaro Railroad. Postoffice and telegraph station.

ROUTES TO CIENFUEGOS.

1. From Habana to Batabanó by United Railways, and then by sea.
2. From Habana to Bemba by United Railways, then to Santo Domingo by Cárdenas-Santa Clara Road, and then by Sagua la Grande, Cienfuegos, and Santa Clara Railway.

CIENFUEGOS is a city of 41,000 inhabitants, capital of the judicial district of the same name, situated in the southern part of the island in latitude 22° 9' N. and longitude 73° 50' W. It is united to the main railroad

system of the island, the distance to Habana by rail being 189 miles. Post office, telegraph station, and railroad to Santa Clara.

Cienfuegos (hundred fires) was founded in 1819, destroyed by a hurricane and rebuilt in 1825. It is located on the east side of the harbor of Agua, which Las Casas called "the most magnificent port in the world," and it is certainly one of the most beautiful. It is commercially the most important port of entry on the southern coast, and, ranking with Sagua, is the fourth or fifth port of importance on the island. Cienfuegos is now the center of the sugar trade for the southern part of the island. Sugar and tobacco are exported to the United States, and soap and ice are manufactured. It is built upon a site of which a part projects, peninsula-like, into the harbor. The town occupies about 150 acres. It commences at the water front, which is about 3 feet above the sea, and slopes upward to an elevation of about 75 feet, this being the highest point where the houses are built, but not the summit of the ascent. More than one-third of the town was formerly a mangrove swamp, and at least one-third of the population lives where the subsoil is within 3 to 6 feet of the surface and where the contents of the privies rise and fall with the tide. The whole town is commanded by the waterworks building, which is 100 feet above the sea. The drainage is good, but nevertheless many houses have stagnant pools of water in front of them. The streets are 40 feet wide and macadamized. The most famous building in Cienfuegos is the Terry theater. Although the waterworks has a good plant, it fails as yet to supply water. About one-third of the population have underground cisterns, and sell water to the other two-thirds. The houses are small wooden ones, the floors directly on the ground and only a few inches above the sidewalks. Many of the floors are on a level with the streets and some are even below.

The harbor is of the first class, affording safe anchorage for the largest vessels. It is about 11 miles long by from 3 to 5 miles in width, and is entered from the south by a deep, narrow channel about 3 miles long. This entrance is probably fortified. The location of such fortifications, however, cannot be elevated much above sea level. Slightly back of this are supposed to be some important fortifications elevated on the ridges between the ocean and the bay. The entrance to the bay is so narrow that, in case it was desired, a vessel could be sunk there and effectively imprison all the vessels in the harbor.

The town is about 5 miles distant from the harbor extremity of the channel. Three rivers of considerable size, two to the north and one to the south of Cienfuegos, empty into this large harbor, besides several smaller streams. The harbor is, for the most part, inclosed by beautiful hills, while its southern extremity is adorned by a chain of picturesque mountains of even majestic appearance. Humboldt says: "The hills of San Juan form a limestone chain, very steep on its southern side, and some 1,800 to 2,000 feet high, their naked and arid summits now rounded, and now forming high and steep peaks." The temperature falls very low here while the northers prevail; it never snows, but frost and hail are sometimes seen in these mountains and in those of Santiago. The climate from December 1st until May is dry and moderately warm, the temperature ranging from 60° to 78° during the day and falling several degrees at night. During this period almost constant winds prevail from the northeast or northwest, accompanied by clouds of dust. For the rest of the

year the temperature ranges from 75° to 93°, descending a few degrees at night, and there are frequent and heavy rainfalls and windstorms. The yellow fever is then epidemic.

The anchorage ground (depth of water 27 feet) is from one-eighth to one-half mile distant from the water front of Cienfuegos. Some 20 wharves extend about 300 feet from the shore into the harbor, and the water at these points is from 12 to 14 feet deep, so that many vessels are moored at these wharves during their entire stay. Steamers of more than 2,000 tons receive the first part of their cargo at the wharf and the balance thereof by lighters at the anchorage ground. No ballast is kept at Cienfuegos; the few vessels needing it procure it by lighters from the opposite western shore of the harbor.

The death rate is about 43. In addition to yellow fever, smallpox causes great mortality in Cienfuegos, the popular prejudice being very strong against vaccination. Fully one-half of the sick suffer directly with malaria, which complicates nearly every disease. Yellow fever is considered as endemic here—that is, that its poison is annually and habitually present.

SAILING DIRECTIONS.

Port Xagua, or Cienfuegos, is quite secure in all winds, with a depth sufficient for vessels of the heaviest draft; but its channel is so narrow and tortuous and the tides are so strong that it is very difficult to navigate. The entrance, between Colorados Point on the east and Sabanilla or Vigia Point on the west, is $1\frac{1}{4}$ miles wide (the bank fringing the coast on the western side of entrance to this port extends from the shore about 200 yards, at midway between Sabanilla Point and Angeles Castle); but 2 miles within, between Pasacaballos and Angeles Points, it is narrowed to little more than 200 yards across, and here takes a sharp turn from NW. to NNE., carrying the same breadth for three-fourths of a mile to Milpa Point on the east, at the inner end of the channel, when it opens out into a large harbor.

The buoys moored on the east side of the Ensenada de Marsillan, and one at the eastern edge of Cayo Carenas Shoal, also one marking Sierpe Shoal, off the Damuji River, are not permanent, but are maintained by the pilots, who shift them according to their requirements. There are several shoal patches of sand in the Ensenada de Marsillan, but they are not dangerous to navigation, as they are out of the usual track of vessels, and besides are easily seen, owing to the smoothness and transparency of the water.

The town of Ferdinanda de Xagua, or Cienfuegos, is built on a peninsula on the eastern side of the bay. This peninsula separates two large bays, each affording excellent anchorage.

Vessels discharge into lighters till their draft is reduced to 14 feet, when they can haul alongside of the wharf.

The sanitary condition is good, the city being clean. There is a health officer, who boards all vessels. Quarantine is not very strict and rarely lasts more than a day or two. The public hospital is under government control and accommodates 250 patients. Foreigners are charged \$2 per day. A doctor is in charge, assisted by a corps of trained nurses. There is also a small private hospital.

The United States is represented by a consul and vice consul. Authorities to visit are the military governor and captain of the port.

Light.—On Colorados Point, from a tower 45 feet high, a fixed and flashing light, every 2 minutes, is shown, visible 14 miles.

Supplies.—The market for fresh provisions is good and the price fair, large quantities of salt provisions being kept on hand.

River water can be obtained from water boats, 1½ cents a gallon. There are pipes at the wharves, where water can be obtained by boats.

Coal.—There is an extensive coal yard, where a large supply of coal is kept, at a cost of \$8 to \$8.75 per ton. Small vessels can coal at the wharf; large vessels lie almost half a mile off.

Docks.—There are two slips, where vessels 200 feet long, drawing 8 feet forward, 12 feet aft, may be hauled up; also two machine shops, where steamers may repair.

Steamers.—Ward's line from United States call twice a month during the busy season, and once a month during the rest of the year. Atkins line from Boston call once a month, only during the busy season.

Telegraph.—A land line to Habana. A submarine telegraph cable has been laid between Cienfuegos and Manzanillo, with intermediate stations at Casilda, Tunas de Zarza, Júcaro, and Santa Cruz del Sur.

Mail is received twice a month by steamer and twice a week by rail from Habana. A railroad runs between this place and Habana.

Pilots are under the control of the captain of the port, and are reliable. Pilotage is compulsory, except to vessels under 80 tons. Vessels coming into port or going out at night, between sunset and one hour before sunrise, pay double pilotage. Pilotage fees on foreign vessels in and out: For vessels of from 81 to 100 tons, \$11 (Spanish gold); 101 to 150, \$13; 151 to 200, \$14; 201 to 250, \$15; 251 to 300, \$17; 301 to 350, \$19; 351 to 400, \$21; 401 to 450, \$23; and for each additional 50 tons up to 4,501 tons, \$1. For vessels of from 4,501 to 5,000 tons, \$38; over 5,000 tons, \$40. For removals in the harbor from anchorages to moles, or between moles, the pilotage varies from one-third to two-thirds of the actual pilotage for coming in and going out.

Mooring and unmooring on all foreign vessels exceeding 80 tons is compulsory and varies from 87½ cents on 100 tons to \$3.15 (Spanish gold) on 5,001 tons and over.

Towage.—For vessels of from 100 to 200 tons, \$30 (Spanish gold), and \$10 for each additional 100 tons or fraction thereof.

The charges on a vessel of 360 tons are: Pilotage, \$42; towage, \$100; watchman, \$3; interpreter, \$2. Vessels of more than 500 tons pay \$4 for watchman.

Directions.—In entering the harbor of Cienfuegos give the shore east of Colorados Point a berth of one mile, but the point itself may be passed within 500 yards. Then keep in mid-channel all the way to where the shores separate to form the bay. The eastern interior point is called Milpa Point, and off it a spit extends for one-quarter mile, with 8 feet of water on it. North of Milpa Point is the bank of the same name, to avoid which steer for the SE. end of Carenas Cay as soon as Milpa Point is abeam. When the north point of Alcatraz Cay bears east (N. 86° E. mag.), Milpa Bank is passed, and the vessel may anchor, if desirable, in 7 or 10 fathoms of water.

If intending to proceed farther, Carenas Cay should be passed on the starboard hand, as a long spit connects it with the northern shore. The assistance of a pilot will be necessary, as, although the edges of the banks or shoal are generally marked by stakes or buoys, they are liable to be changed and can not be depended upon.

Tides.—It is high water, full and change, at Port Xagua at 4h. 57m., and the rise is 2 feet.

Caution.—As the current runs about three knots, vessels going with the tide must be particularly careful in rounding Pasacaballos Point, as they are apt to be swept on the opposite shore. The banks are reported as extending.

5. AYUNTAMIENTO OF LAS CRUCES.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Malá Requa.....		
2. Mal Tiempo	4½	
3. Viga (La).....	6	

LAS CRUCES is a town situated 19 miles from Cienfuegos, on the Cienfuegos and Sagua la Grande railroads. Post office and telegraph station.

6. AYUNTAMIENTO OF PALMIRA.

PALMIRA is a town of 2,987 inhabitants, situated 8½ miles from Cienfuegos. Cienfuegos Railroad to Santa Clara, Congojas, and to the sulphur baths of Ciego Montero. It is on the calzada (high road). Post office, telegraph, and telephone to the central station.

7. AYUNTAMIENTO OF RODAS.

Capital, Rodas.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Congojas	3½	
2. Habacoa.....	3½	
3. Limones.....	5	
4. Medidas.....	7	

RODAS is a town of 2,230 inhabitants, situated 23½ miles from Cienfuegos. Post office, telegraph, and railroad to Cartagena, which is 22½ miles distant.

8. AYUNTAMIENTO OF SANTA ISABEL DE LAS LAJAS.

Capital, Santa Isabel de las Lajas.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Aguadita	3	
2. Nuevas	3	612 inhabitants.
3. Salado	11	559 inhabitants.
4. Salto	3½	1,176 inhabitants.
5. Santa Rosa	6	698 inhabitants.
6. Terry	5	1,135 inhabitants.

SANTA ISABEL DE LAS LAJAS is a town of 3,102 inhabitants, with 1,822 in its suburbs, and is situated 31 miles from Cienfuegos. Stage coach to Cartagena. By the railroad it is 22 miles to Cienfuegos. Post office and municipal telegraph.

II. JUDICIAL DISTRICT OF SAGUA LA GRANDE.

Population, 89,826.

Townships.	Population.
1. Amaro	7,251
2. Calabazar	8,898
3. Ceja de Pablo	10,700
4. Quemados de Güines	14,000
5. Rancho Veloz	8,237
6. Sagua la Grande	23,740
7. Santo Domingo	17,000

1. AYUNTAMIENTO OF AMARO.

CIFUENTES is a town of 1,887 inhabitants, chief city of the Ayuntamiento of Amaro, situated 13 miles from Sagua la Grande. Three casinos, Sagua railroad, and post office.

2. AYUNTAMIENTO OF CALABAZAR.

Capital, Calabazar.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Granadillo	10½	
2. Santo (El)	22½	
3. Viana	10	

CALABAZAR is a town 20 miles southeast from Sagua la Grande. It is of little importance, except as possessing the longest railroad bridge in Cuba. This is built of stone and iron. The town lies in a hollow, through which flows the Calabazar River, which is narrow, but deep and rapid. The banks are low, but the valley is commanded by hills of considerable height.

3. AYUNTAMIENTO OF CEJA DE PABLO.

Capital, Corralillo, 30 miles from Sagua la Grande.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Palma Sola	5½	
2. Sierra Morena	3½	

CORRALILLO is a town of 2,000 inhabitants. Capital of ayuntamiento. Post office.

SIERRA MORENA is a town of 1,600 inhabitants.

4. AYUNTAMIENTO OF QUEMADOS DE GÜINES.

Capital, Quemados de Güines.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Carahatas	8½	

QUEMADOS DE GÜINES is a town of 2,000 inhabitants, situated 12½ miles west from Sagua la Grande. Post office and telegraph station.

5. AYUNTAMIENTO OF RANCHO VELOZ.

Capital, Rancho Veloz.

Outlying districts.	Distance from capital.	Remarks.
	<i>Miles.</i>	
First district, Santa Fé ..	-----	
Second district, Guanillas ..	-----	
Third district, Playa de Sierra Morena.	6½	

RANCHO VELOZ is a town of 656 inhabitants, situated 24½ miles from Sagua la Grande. Post office and telegraph station.

6. AYUNTAMIENTO OF SAGUA LA GRANDE.

Capital, Sagua la Grande.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Alvarez	39	Cárdenas and Júcaro Railroad.
2. Guatá de la Izquierda ..	3	
3. Isabela (La)	9½	A port with much commerce.
4. Jiquiabo (San Pedro de)	30	
5. Jumaguas	3½	
6. Mordazo	36	Cárdenas and Júcaro Railroad.
7. Pueblo Nuevo de San Juan.	½	500 inhabitants.

ROUTES TO SAGUA LA GRANDE.

1. From Habana to La Isabela by sea and then by Sagua la Grande Railroad.

2. From Habana to Bemba by United Railways, then to Santo Domingo by Cárdenas, Bemba, and Santa Clara Railroad, and from there by the Sagua la Grande Railroad.

SAGUA LA GRANDE is a city of 14,000 inhabitants, situated in latitude N. 22° 49' 50" and longitude west from Cadiz 73° 45' 36" (80° 29' 59" west of Greenwich). It is 10 miles from the port of Isabela de Sagua with which it is in communication by means of a railway, making three trips daily. This railroad also puts it in daily communication with Santa Clara, Cienfuegos, and Habana which is 259 miles away. There is a town hall, board of education, board of health, two private schools, eight municipal schools for white children and two for colored children of both sexes, a Spanish casino and others for laborers, two theaters, a magnificent church, two military barracks, and a hospital called "Charity Hospital." Aside from a wooden armory there are about twelve or fifteen small forts built mostly of wood, and each capable of holding about thirty men. These forts are built with an outer and inner wall, between which packed earth is placed.

This town was founded about 1817. It has wide streets, houses of wood, machine shops, and lumber yards. The Sagua River is not bridged and is unfordable, but it is navigable for small boats to the sea. The export trade is confined almost exclusively to sugar.

Aside from the railroad communications to the interior, a number of plantations around the neighborhood carry their narrow gauge lines near the town for the purpose of sending away their sugar and carrying to the plantations material for the sugar houses. These roads are, as a rule, in fairly good condition, and all are equipped with a large number of flat cars and fairly powerful locomotives. The roadbeds of these railways would afford good routes for marching troops from the comparatively marshy shore to higher ground. The line from Sagua to the seaport, La Boca, runs for about 10 miles on hard ground, bounded on either side by plantations and running parallel to the river. About 2 miles from La

Boca, the ground becomes soft and marshy and the road runs on an embankment up to the wharves and sandy beach of the seaport. When nearing the latter, this embankment is a few hundred feet from the river which can be seen from the railroad cars. There are no fortifications in La Boca to speak of, as the Spanish Government has relied upon a gun boat or two in the bay to protect it from molestation by the insurgents. The country between Sagua and La Boca is entirely level with very few trees and is used largely for the raising of sugar cane and for grazing.

The death rate is 40-50. Apparently yellow fever did not begin in Sagua until the railroad was completed in 1858. Resident physicians claim that yellow fever was imported to this place from Habana.

LA ISABELA (also called La Boca and Concha).—This town of 5,000 inhabitants is the port of Sagua la Grande, and is situated at the mouth of the Sagua river. The town is built in a swamp, the solid ground being made land. The houses are mostly of wood, and built on piles. It has piers, warehouses, railroad repair shops, and ship offices. There are many sugar warehouses and a tramway running to the wharf. There is a custom-house here through which more than 400,000 sacks of sugar are exported annually. It has a naval command of the second class, and is a bathing resort in the summer. The population is mixed. This seaport has no inclosed harbor, but a roadstead protected by islands. By the chart this roadstead is so shallow that its greatest depth is 15 feet, and this depth is not nearer the shore than $2\frac{1}{2}$ miles, while a depth of 18 feet is not found until 6 miles distant from the mainland beyond the islands which guard the roadstead.

SAILING DIRECTIONS.

HARBOR OF SAGUA LA GRANDE.—About 2 miles NW. of the entrance to the Boca Marillanes lies Cristo Cay, with the Boca de Cristo midway between: and 6 miles WNW. of the north point of this cay is the entrance to the Boca Sagua la Grande. This port is considered to extend 13 miles WNW. and ESE., and 6 miles north and south. Of the several channels leading to the anchorage for loading, the only practicable one for vessels of over 8 feet draft is the Boca Marillanes.

As the cays which surround the port are low, and the greater portion of them composed of mangroves, the winds cause much sea notwithstanding the little depth. It is necessary in bad weather, and particularly in the months of September and October, to take every precaution for security. There are many beacons (piles) laid out on the projecting points and shoals, but they can not be relied on.

The mouth of the Sagua la Grande River lies about 4 miles SSW. of the entrance to the Boca Marillanes, and is connected with the interior by a railway. The bar is passable for vessels of 6 feet draft. The town stands about 12 miles in a direct line from the coast, but 21 miles by the windings of the river.

There is communication with the harbor by river boats and a railroad. Vessels quarantined are sent between Cay Palomo and Cay Bamba.

There are six tugboats in the harbor.

The United States is represented by a commercial and vice-commercial agent.

Coal can be obtained.

Pilotage is compulsory except to vessels drawing less than 11 feet or measuring less than 250 tons (total tonnage). Between sunset and one hour before sunrise double pilotage is exacted. Vessels calling for orders, if they remain less than a week, will pay half pilotage.

Total capacity.	By Marillanes.	By Boca de Sagua.	Moving to or from wharf.	Leaving wharf, or changes made in bay.	Changes made at same wharf.
60 to 150 tons.....	\$8.00	\$10.00	\$3.35	\$2.00	\$1.35
150 to 200 tons.....	10.00	12.00	4.15	2.50	1.70
200 to 300 tons.....	13.00	15.00	4.45	3.25	2.20
300 to 400 tons.....	17.00	19.00	7.10	4.25	2.85
400 to 500 tons.....	21.00	23.00	8.75	5.25	3.50
500 to 600 tons.....	23.00	25.00	10.00	5.75	3.85
600 to 700 tons.....	25.00	27.00	10.45	6.25	4.15
700 to 800 tons.....	29.00	31.00	12.10	7.25	4.85
800 to 1,000 tons.....	33.00	35.00	13.75	8.25	5.50
1,000 to 1,300 tons.....	36.00	38.00	15.00	9.00	6.00
1,300 to 1,600 tons.....	39.00	41.00	16.25	9.75	6.50
1,600 to 2,000 tons.....	41.00	43.00	17.10	10.05	6.85
2,000 to 2,500 tons.....	43.00	45.00	17.95	10.75	7.15
2,500 tons and upward.....	45.00	47.00	18.80	11.25	7.50

Dues.—No tonnage or light dues Health visit, \$4.. Inspection visit, \$4. Extending protest, \$5. Certificate to protest, \$3.50. Translation of manifest, 1 to 25 lines, \$2.50; 26 to 50 lines, \$5; 51 to 200 lines, \$10.

Directions for the Boca de Marillanes.—Vessels bound to Sagua la Grande through this channel should make Cristo Cay, on the east end of which are some huts, with a flagstaff bearing a blue flag with the letter P, in white, marking it the pilot station. When about a mile N. 48° E. (N. 45° E. mag.) of the flagstaff, steer S. 20° E. (S. 23° E. mag.), passing eastward of Fradera Rock, with beacon, and westward of the iron buoy on the west edge of the Marillanes Bank. The buoy is in 19 feet water, and there is as little as 6 feet water on the bank, the sea generally breaking on it. On nearing the bar, a buoy, in 17 feet water, marking the western sand banks, will be seen, and which should be left to the westward.

When abreast this latter buoy alter course to S. 31° W. (S. 28° W. mag.), which, skirting the weather reef, leads in mid-channel between the Mariposa and Cruz Cays, leaving a beacon on the shoals between Palomo Cays and Cay Cruz on the starboard hand; then haul up and pass close westward of the buoy placed near the edge of the spit extending from Mariposa Cay; when S. 10° W. (S. 7° W. mag.) a course may be steered, passing the next, a bell buoy, on the port hand; anchorage may now be taken up in about 2½ fathoms water.

Leaving by this passage a vessel should take the advantage of the land wind, which blows regularly from daylight until 10 a. m., when the sea breeze sets in: the channel is too narrow for working. In case of calm or not sufficient wind, it will be necessary to anchor, the tide not setting fairly through the channels.

Boca Sagua la Grande affords a passage only for vessels of 8 feet draft, although at the entrance there are between 4 and 5 fathoms water, shoaling within. There is good anchorage in 3 fathoms about one-half mile southward of Muertos Point.

Light.—On the NW. point of Hicacal Cay a fixed white light is shown from a mast above the keeper's dwelling, 55 feet above the sea, and visible 12 miles. The keeper's dwelling may be known by its red doors and windows; eastward of it there are a few fishermen's huts.

7. AYUNTAMIENTO OF SANTO DOMINGO.

SANTO DOMINGO is a town of 1,500 inhabitants, situated 18 miles from Sagua la Grande and 23 miles from Santa Clara. Cárdenas and Júcaro Railroad, telegraph station, and post office. It is on a railroad between Habana and Santa Clara, and is also on the railroad between Sagua la Grande and Cienfuegos. It is on the river Sagua la Grande, and on the calzada (highroad) between Habana and Santa Clara.

III. JUDICIAL DISTRICT OF SANCTI SPIRITUS.

Population, 30,940; area, 1,438 square miles.

Township.	Population.
Sancti Spiritus	30,940

1. AYUNTAMIENTO OF SANCTI SPIRITUS.

Capital, Sancti Spiritus.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Banao	12½	Railroad, post office, and telegraph station.
2. Cabaiguan	11½	
3. Paredes	6½	
4. Guasimal	13	
5. Guayos	9	
6. Jibaro	30	
7. Tunas de Zaza	25	
8. Zaza	17	

ROUTES TO SANCTI SPIRITUS.

1. From Habana to Santa Clara by rail and then by road.
2. From Habana to Batabanó by road, then by sea to Las Tunas, and then by rail.

SANCTI SPIRITUS is a city of 17,500 inhabitants, capital of the judicial district of the same name, situated 345 miles from Habana. Communications with that city are carried on by rail to Tunas, then coasting steamers from there to Batabanó, and then by rail again to Habana.

Sancti Spiritus is one of the oldest cities in Cuba, having been founded in 1514 by Diego Velazquez. It is about 30 miles from the northern and

39 miles from the southern seacoast, and some 50 miles southeast of Santa Clara, the extreme eastern point to which the Cuban main trunk line has been completed. Its seaports are Zaza, located on the river Zaza, a few miles from its mouth and navigable to the town, and Las Tunas on the southern coast. Sancti Spíritus is united to these towns by a railroad about 25 miles in length, from the city to the village of Las Tunas. The town is situated on both banks of the river Yayabo, which flows 5½ miles to empty into the Zaza at a point about 20 miles from the sea. The seaport is Las Tunas de Zaza. The streets are generally narrow and tortuous, and the elevation is 156 feet. It has a second-class college, two hospitals, an asylum for girls, a board of education, and a board of health. Post office and telegraph station.

The climate of Sancti Spíritus is not healthful, because of the dampness of the soil. Yellow fever is said to prevail at rare intervals.

SAZA (or Zaza, or Tunas de Zaza).—This town is on the southern coast, about 25 miles from Trinidad, and is the seaport of Sancti Spíritus. It has not only a multiplicity of names, but confusion as to these, for while some authorities designate the seaport Zaza, or Tunas de Zaza, the railroad guide terms the seaport "Las Tunas," and a little village some 5½ miles north, on the Zaza River, is designated "Zaza."

This port of entry is, after Santa Cruz, the port of least importance to American commerce. The harbor is very small, and, by the chart, so shallow that only 12 feet of water is marked outside of the harbor, more than a mile from the town.

The town is quite a small place, the population, including the part called "Magano," being about 1,500 (population of town itself 1,000, three-fourths white). It is the terminus of the Tunas and Sancti Spíritus Railway. It sprang up when the road was opened, some forty years ago, and has made but little progress since. Land in the neighborhood is unfit for agricultural purposes, and the supply of vegetables has to be brought by rail or boats. Water is very scarce, since there are only a few badly built cisterns. Water is brought in tanks by the railroad company and sold to the public at a high price; it is not always on hand, and at times there is a dearth for several days. There is a small tannery, but it has no modern accessories, having not even a mill for grinding bark. Exports consist of sugar, cedar, mahogany, and other lumber, tobacco, wax, and honey. Cattle raising is an important industry of the province. The climate in winter is pleasant, warm in the day and cool in the evening; in summer, as a rule, it is warm all the time. There is very little sickness in the locality, although this town is only 2 feet above the level of the sea. Yellow fever is not indigenous, but imported to this place. The disease has never prevailed here, as there are only a few cases on record.

SAILING DIRECTIONS.

PORT TUNAS, between Zarza Point and Caney Point, is a small bay with a depth of from 2½ to 4½ fathoms, with a bottom of clay and weeds. Port Tunas is the seaport of the town of Sancti Spíritus, with which it is connected by a railroad.

Vessels bound to Tunas will find the Trinidad Range of mountains, which can be seen for a distance of 30 miles, a good landmark, also, the range of mountains to the eastward, separated from the Trinidad Range by low land.

When the eastern mountain, known as Loma de Banao, bears N. 8° E. (N. 5° E. mag.) it may be steered for, and the bank entered upon in 6 fathoms of water, 5 miles from Zarza de Fuera Cay and 8 miles from Marchas de Fuera Cay.

These cays are on the bank, are both low and covered with small trees and mangroves, and can be seen 8 or 10 miles.

The bank is clear of danger to within 4 miles of the southern or Zarza de Fuera Cay, and to within 2 miles of Marchas de Fuera Cay.

The soundings on the bank will be at first 6 and 7 fathoms, and then 5, 4, 6, 8, and 10 fathoms will be obtained, followed by a decrease to 5 and 4 fathoms until the port is reached. As the land is neared, the harbor will be recognized by Blanco Zarza Cay, which lies to the westward of it, and the tall chimneys of the sugar mill on the coast eastward of the port.

IV. JUDICIAL DISTRICT OF SAN JUAN DE LOS REMEDIOS.

Population, 38,626; area, 1,342 square miles.

Townships.	Population.
1. Buena Vista	
2. Caibarién	15,915
3. Camajuani	12,937
4. Placetas	13,936
5. San Antonio de las Vueltas	16,271
6. San Juan de los Remedios	15,550
7. Yaguajay	10,786
8. Zulueta	

1. AYUNTAMIENTO OF BUENA VISTA.

BUENA VISTA is a town situated 10 miles from San Juan de los Remedios.

2. AYUNTAMIENTO OF CAIBARIÉN.

CAIBARIÉN is a town of 12,000 inhabitants, situated 5½ miles from San Juan de los Remedios. It has a board of education and a board of health. It is a port with considerable pilotage and coasting trade. Caibarién United Railroad, post office, and telegraph station.

This town, founded in 1822, is on the north coast, about midway of the length of the island. It is seventh in importance of the Cuban ports of entry, and the seaport of the inland town of Remedios. It is located on a former mangrove swamp at the mouth of the Caibarién River, and is only 8 feet above the level of the sea, while its environs are not more than 10 feet. Pezuela states that "notwithstanding its unfavorable location, it is quite a healthful place." The death rate is said to be about 29. The doctors here dispute whether yellow fever is indigenous or imported. The disease occurs in certain years only.

A railroad runs from Caibarién to San Andrés via Remedios, the distance to San Andrés being 28½ miles, and a steamship line connects it once a week with Cárdenas. It has no harbor; the roadstead is so shallow that vessels anchor at the key or little island of Frances, some 25 miles northeast of

Caibarién. The houses are of brick with tile roofs. There are large stone sugar warehouses. There are no harbor defenses, but blockhouses surround the place. These blockhouses are ditched, earth is thrown up as high as the loopholes, and then the fort is surrounded by barbed wire entanglements. No barricades in the streets. The churches are loopholed and embanked.

SAILING DIRECTIONS.

Caibarién, on the mainland, about 15 miles from Cay Frances, is the port of San Juan de los Remedios, about 5 miles in the interior, the communication being by railroad. The channel to this port lies between Boca Chica, a small flat cay 4 miles S. 56° W. (S. 53° W. mag.) of the western part of Cay Frances, and the west end of Cobos Cay. Vessels drawing under 9 feet can anchor off the town Caibarién, but those of heavier draft load at Cay Frances.

Pilotage is compulsory, except to vessels under 50 tons register and coasters which have a regular pilot on board; the rates are as follows: Up to 100 tons, \$10; 101 to 200 tons, \$15; 201 to 300 tons, \$20; 301 to 400 tons, \$23; 401 to 500 tons, \$25; 501 to 600 tons, \$27; 601 to 700 tons, \$29; 701 to 800 tons, \$31; 801 to 1,000 tons, \$34; 1,001 to 2,000 tons, \$37; 2,000 tons and upward, \$40.

For moving vessels at anchorage inside of Cay Frances up to 20 feet draft, one-third pilotage will be paid. For moving vessels from Cay Frances up to the bay, half pilotage will be paid. For moving vessels to any other anchorage inside of Cay Frances two-thirds pilotage will be paid. Vessels calling at Cay Frances for orders that do not load here will pay one-quarter pilotage. Vessels in distress and men-of-war pay regular pilotage.

There are no light or tonnage dues.

Weather signals.—The following signals are shown from the port office flagstaff:

A red triangle indicates a probable storm; a blue and white flag horizontally striped, that the storm is approaching; a black ball shown with either of the above signals indicates that the weather is improving.

By night: A white light shown from a flagstaff indicates approaching foul weather.

3. AYUNTAMIENTO OF CAMAJUANI.

CAMAJUANI is a town of 4,180 inhabitants, situated 17½ miles from San Juan de los Remedios. Sagua la Grande and Caibarién Railroads. Post office and telegraph station.

4. AYUNTAMIENTO OF PLACETAS.

Capital, Placetas.

Outlying villages.	Distance fr. m capital.	Remarks.
	<i>Miles.</i>	
1. Guaracabuya	5½	Post office and telegraph station.
2. Hernando	3	Post office.
3. Nazareno	8½	Post office.
4. Tibicial	8½	
5. Vista Hermosa	3	

PLACETAS is a town of 5,280 inhabitants, situated $21\frac{1}{2}$ miles from San Juan de los Remedios. The nearest station is San Andrés $5\frac{1}{2}$ miles away. Post office and telegraph station.

ROUTES TO PLACETAS.

1. From Caibarién by rail.
2. From Sancti Spíritus by pike.

5. AYUNTAMIENTO OF SAN ANTONIO DE LAS VUELTAS.

Capital, San Antonio de las Vueltas.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Aguada de Moya.....	1	Sagua la Grande Railroad.
2. Piedras.....	$3\frac{1}{2}$	
3. Quinta.....	3	
4. Sagua la Chica.....	$12\frac{1}{2}$	
5. Taguayabon.....	$5\frac{1}{2}$	Caibarién Railroad to Sancti Spíritus.
6. Vega Alta.....	8	Sagua la Grande Railroad.
7. Vegas de Palma.....	2	Caibarién Railroad.

SAN ANTONIO DE LAS VUELTAS is a town of 916 inhabitants, situated $14\frac{1}{2}$ miles from San Juan de los Remedios. The nearest station is Vegas de Palma, 2 miles away. Post office and telegraph station.

6. AYUNTAMIENTO OF SAN JUAN DE LOS REMEDIOS.

Capital, San Juan de los Remedios.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Buena Vista.....	$10\frac{1}{2}$	
2. Coloradas.....	-----	
3. Egidos.....	-----	
4. Gueiba.....	$13\frac{1}{2}$	

ROUTES TO SAN JUAN DE LOS REMEDIOS.

1. From Habana by sea to Caibarién, then by rail.
2. From Habana by United Railways to Bemba, then by the Cárdenas-Júcaro Railroad to Santo Domingo, and then by the Sagua la Grande and Camajuani Railroads.

SAN JUAN DE LOS REMEDIOS is a town of 7,230 inhabitants, capital of the judicial district of the same name, situated $40\frac{1}{2}$ miles from Santa Clara, 295 from Habana, and $5\frac{1}{2}$ from its port, Caibarién. It is also called Cayo (key) because it was founded in 1545 upon an island. It has a charitable board and a board of education.

A railroad, destined for Sancti Spiritus, is completed from Caibarién, via Remedios, some 28 miles southwest, to San Andrés. Remedios is elevated 60 feet above the sea. It has a post office and telegraph station.

The death rate is about 45. The mayoralty report states that "yellow fever is believed to be indigenous here, but that it does not habitually prevail."

7. AYUNTAMIENTO OF YAGUAJAY.

YAGUAJAY is a township situated 29 miles from San Juan de los Remedios. It has asphalt mines and nine sugar mills. The sugar mills have a narrow gauge railroad running down to the beach to facilitate the exportation of the product. Sancti Spiritus and Remedios highroad runs through here. The town is fitted for coasting trade. Post office and telegraph station.

8. AYUNTAMIENTO OF ZULUETA.

ZULUETA is a town situated 11 miles from San Juan de los Remedios.

V. JUDICIAL DISTRICT OF SANTA CLARA.

Townships.	Population.
1. Esperanza (La)	10,733
2. Ranchuelo	5,000
3. San Diego del Valle	9,987
4. San Juan de las Yeras	7,806
5. Santa Clara	

1. AYUNTAMIENTO OF ESPERANZA (LA).

Capital, La Esperanza.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Asiento Viejo Este	
2. Asiento Viejo Oeste	
3. Jabonillas	
4. Nuevas	
5. Purial	
6. San Vicente	
7. Torre-José	

ESPERANZA (LA).—The township of Esperanza has 15 colonies, 92 stock farms, 647 cultivated farms, and 5 sugar mills. Cienfuegos Railroad to Santa Clara and Cárdenas Railroad to Júcaro. The town itself is on the calzada, 10 miles northwest of Santa Clara. Population, 2,147. There is a post office and telegraph station.

2. AYUNTAMIENTO OF RANCHUELO.

RANCHUELO is a town of 2,000 inhabitants, situated $27\frac{1}{2}$ miles from Cienfuegos. Cienfuegos Railroad to Santa Clara. Telegraph, telephone, and post office. It is the capital, and counting both the two rural and the two town districts, it numbers 5,000 inhabitants.

3. AYUNTAMIENTO OF SAN DIEGO DEL VALLE.

Capital, San Diego del Valle.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Hatillo	$7\frac{1}{2}$	
2. Jicotea	$2\frac{1}{2}$	
3. Jabucito	$3\frac{1}{2}$	
4. Maguaraya	$8\frac{1}{2}$	
5. Mango	$6\frac{1}{2}$	
6. Niguas	$3\frac{1}{2}$	
7. Sitio Nuevo	4	

SAN DIEGO DEL VALLE is a town of 404 inhabitants, situated $15\frac{1}{2}$ miles from Santa Clara. The nearest station is Jicotea, $2\frac{1}{2}$ miles away. It has a post office and telegraph station.

4. AYUNTAMIENTO OF SAN JUAN DE LAS YERAS.

Capital, San Juan de las Yeras.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Aguas Benitas	5	
2. Bernia	6	
3. Guayo	$4\frac{1}{2}$	
4. Potrerillo	$7\frac{1}{2}$	
5. Quemado Hilario	6	

SAN JUAN DE LAS YERAS is a town of 2,267 inhabitants, situated 14 miles from Santa Clara. The nearest station is Ranchuelo, $3\frac{1}{2}$ miles away. It is said that a branch road connects Ranchuelo with San Juan, 6 miles distant. Post office.

5. AYUNTAMIENTO OF SANTA CLARA.

Capital, Santa Clara.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Baez	8½	2,315 inhabitants.
2. Cruz (La)	9½	5,250 inhabitants.
3. Manicaragua (La Moza)	28	3,521 inhabitants.
4. Manicaragua (La Vieja).	30	Fine tobacco here.
5. Provincial	18	2,400 inhabitants.
6. San Gil	12½	5,180 inhabitants.
7. Seibabo	12½	2,500 inhabitants.

ROUTES TO SANTA CLARA.

From Habana by United Railways to Bemba, then by the Cárdenas, Bemba, and Santa Clara Division of Cárdenas-Júcaro Railroad.

SANTA CLARA is a city of 34,655 inhabitants, capital of the province and judicial district, situated 245 miles from Habana. This city is also known as Villa Clara. It was founded in 1664 or 1689, and is the eastern terminus of the main trunk Cuban railroad, the distance to Habana by rail being 194 miles. It is about 30 miles from Sagua, its northern port of entry, and is about 49 miles from Trinidad, a port of entry on the southern coast. It is situated at considerable elevation, though the surrounding country is somewhat flat. It has broad streets, is well built, and is a military post of importance. While the extent of the fortifications collectively is great, specifically there are none of large importance, since they are intended solely for protection against a land attack. No heavy ordnance whatever is supposed to be mounted in the locality. The dryness of the air and soil and the elevation ought to make it a healthful place, but malarial fevers and dysentery prevail as endemics, and there are also a few cases of yellow fever.

A well of coal oil has been recently discovered near the city which promises to yield abundantly. Also mines of graphite, gold, and copper. At present there is an asphalt mine being worked, from which 10,000 tons are taken annually. The tobacco industry has reached a high state of perfection, owing to the good quality of tobacco, which brings a high price. The town has an electric-light plant, and a theater which was erected by Doña Marta G. Abreu de Estevez; telegraph station and post office.

VI. JUDICIAL DISTRICT OF TRINIDAD.

Population, 30,221; area, 946.847 square miles.

Township.	Population.
1. Trinidad	27,000

1. AYUNTAMIENTO OF TRINIDAD.

Capital, Trinidad.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Cabagan	1	Post office, telegraph, and railroad. It is the port and commercial center of the district. Population in 1877, 3,491.
2. Caracucey	15	
3. Casilda	3½	
4. Condado (El)	11	
5. Guaniquical	13½	
6. Güinia de Miranda	25	
7. Jiquimas	21½	
8. Jumento	31	
9. Río de Ay	12½	
10. San Francisco	12½	
11. San Pedro (or Palmarejo)	15	
12. Sipibo	32	
13. Tayaba	-----	

ROUTES TO TRINIDAD.

1. From Habana to Batabanó by United Railways, then by sea.
2. From Santa Clara by pike.

TRINIDAD is a city of 13,500 inhabitants, capital of the judicial district of the same name, situated 78 miles from Santa Clara and 42 miles from Cienfuegos. It has a board of education, custom house, and a board of health. Its commerce is quite important. Sugar and a little honey are exported. It has four casinos. Post office and telegraph station.

This was the second city founded by Velazquez, in 1514. Among the Cuban ports of entry it is the eighth in importance to American commerce. It is located 3 miles from the seashore in a mountainous section, and is elevated from 180 to 360 feet above the sea, the mean altitude being 220 feet. The town is so situated that the heavier the rains the cleaner it becomes.

Hazard states that the streets of this city are, with some exceptions, narrow and tortuous, and many of those on the edge of the town are unpaved; that it is situated on the side of the mountain Vijia, which has an elevation of about 900 feet above the sea level; that it is exposed to the combined breezes of the sea and mountain, and that it is reported to be the most healthful town upon the island. However, yellow fever is a prevailing disease. Death rate 25.

Humboldt reports that Trinidad has two ports—the harbor of Casilda and the river Guaurabo. "Vessels of light tonnage can ascend the river to within a mile of the city, and can enter safely without a pilot. The port of Casilda is enclosed by the land, but can not be entered without a

local pilot, because of the reefs." From the seaport of Casilda a railroad runs inland, via Trinidad, a little less than 4 miles, to Fernandez, about 18 miles northwest. Trinidad is connected with all southern ports from Batabanó to Cuba by a steamship line which plies once a week.

None of the defenses of Trinidad are individually extensive, but the town is said to have the same cordon of blockhouses, rifle pits, and fortinas that exist everywhere in Cuba. Principal among defensive and other Government works are the cavalry barracks, infantry barracks, and the permanent hospital.

The harbor of Trinidad (Casilda) has a wide entrance, and is about 3 miles long by $1\frac{1}{4}$ wide. Although enumerated among harbors of the "first class," Hazard states that "the anchorage in the bay is not very good, as the water is so shallow that it necessitates the loading of vessels by lighters, unless the vessel is quite small." Vessels drawing 10 feet 6 inches are liable to run aground with the least deviation from the tortuous channel. Four miles east lies Masio Bay, which will accommodate deep-draft vessels.

SAILING DIRECTIONS.

SIERRAS DE SANCTI SPÍRITUS are some high mountains 10 miles inland. Two of the peaks higher than the rest serve as useful landmarks. The northeasterly of these is called the Pan de Azúcar, and may be recognized easily by its flattened summit. Loma de Banao, the other peak, lies 4 miles S. 45° W. (S. 42° W. mag.) of the Pan de Azúcar. Four miles N. 20° W. (N. 23° W. mag.) of the City of Trinidad is another remarkable peak, called Pico del Potrerillo, which is visible 60 miles; also an excellent landmark.

THE CITY OF TRINIDAD is one of the most important on the south side of Cuba. It is situated on high land, 3 miles from the sea, and about one-half mile from the left bank of the Guaurabo River, which is navigable only for boats. Imports and exports are landed and shipped at the harbors of Casilda and Masio, the former lying $2\frac{1}{4}$ miles and the latter $4\frac{1}{4}$ miles from the town.

The town lies on the slope of a remarkable saddle-shaped mountain, and in approaching from seaward a church, 700 feet above the sea, is a conspicuous object. When the mountain behind the town is seen from the west or SW. it has the shape of a gun quoin, and can be seen at a distance of 30 miles.

There are no tugboats; the cargo is landed by lighters.

The United States is represented by a consular agent.

Port Charges.—The pilotage depends on size and rig. Bark or three-masted schooner, \$32; brig or schooner, \$26; custom-house fees, in and out, about \$8; interpreter's fees, about \$4; bill of health, \$2.50; lighterage on coal, \$1 per ton; discharging ballast, 75 cents per ton; labor, \$1.50 per day; tonnage dues and general regulations are the same for all ports of Cuba. Coal can be had for \$8.50 to \$9 per ton; there is generally about 900 tons on hand.

PORTS OF TRINIDAD.—From Agabamba Point to Maria Aguilar Point, 9 miles N. 76° W. (N. 79° W. mag.) of it, and $3\frac{1}{4}$ miles SSE. of the mouth of the Guaurabo, the shore is deeply indented, forming four small inlets.

Jobabo Bay, the easternmost, is only fit for coasters; Caballones, the next, has a depth of from 3 to 4 fathoms; Port Masio has a greater depth than the others; and Port Casilda, the westernmost, has from 2½ to 4 fathoms. muddy bottom. The shore is skirted by numerous cays, reefs, and banks, to the distance of from 2 to 3 miles, and the channels, although deep, are so intricate that a pilot is absolutely necessary. The weather-most channel lies between Machos de Fuera Cay and a small narrow ledge about ½ mile to the westward of it, and has a depth of 3 fathoms, but it is by no means to be recommended, and the sand banks are not stationary.

At 2½ miles to the westward of Machos Cay is Puga Cay, almost level with the sea, which sometimes breaks over it. Tall mangrove trees have grown on this cay, rendering it somewhat conspicuous.

Port Masio, of the ports of Trinidad, will be found the most convenient for a sailing vessel, as it can be entered and left with the prevailing winds. Neither this harbor nor Port Casilda is suitable for vessels drawing more than 15 or 16 feet. For large vessels the best anchorage will be found in from 3 to 4 fathoms of water, with Blanco Cay bearing S. 82° W. (S. 79° W. mag.) and Puga Cay S. 8° E. (S. 11° E. mag.).

In entering either port, the shoals, in clear weather, can generally be seen from aloft. To enter Port Masio take the channel between Blanco Cay and the reef off Puga Cay. The eastern end of the former cay should be passed at ½ mile distance. After passing these cays, if obliged to wait for a pilot, good anchorage will be found, with Blanco Cay bearing N. 87° W. (west mag.), in 3 or 4 fathoms of water.

If intending to proceed without a pilot, bring the southern end of Blanco Cay to bear west (S. 87° W. mag.) and the middle of Puga Cay to bear S. 34° E. (S. 37° E. mag.), and from this point steer N. 40° W. (N. 43° W. mag.). This will lead between the ledge off the NE. end of Blanco Cay, on the port hand, and Cascajal Reef nearly awash on the starboard hand.

PORT CASILDA.—There are three channels: The first east of Blanco Cay; second, west of the same cay; and the third, the Mulatas Channel, close to the eastward reef of that name.

Merchant vessels are obliged to take a pilot at Blanco Cay. If not able to obtain a pilot, a boat should be sent ahead to sound before attempting any of the passages.

The anchorage is in from 16 to 25 feet of water, mud bottom.

Caution.—The stakes marking the channel are frequently changed by the pilots, to keep strangers from learning the pilotage.

Mulatas Channel is shorter than the one just described, and it is said to have a depth of 15 feet, but the aid of a pilot is necessary.

Casilda Harbor is only 800 yards wide, and although it is 2 miles nearer Trinidad than Port Masio a vessel will have to send to the Guaurabo River for water. There are other channels leading to Casilda, but they are somewhat foul, and there are no good leading marks for them. The assistance of a pilot is therefore necessary.

A vessel proceeding to this port should obtain a pilot at Blanco Cay, as the approaches from seaward are narrow and tortuous. If it should be necessary to heave-to outside for a pilot, the port should not be brought to the eastward of N. 70° E. (N. 67° E. mag.) in order to avoid the Mulatas Reefs, extending to the westward of the port.

Tugboats can generally be obtained to assist vessels in calms and light head winds.

Coal.—A small supply may be obtained at times.

Tides.—The tides in the channels run to the SW. and NE. with a strength of $\frac{1}{2}$ mile an hour, rising and falling $1\frac{1}{2}$ feet, but after a SE. wind the rise and fall is 8 feet.

GUAURABO ANCHORAGE.—If it is only desired to communicate with the town of Trinidad, a conveniently accessible anchorage will be found at the mouth of the Guaurabo River, 3 miles to the westward of the town. This anchorage is, however, entirely open to the SW. To enter it, keep on to the NW., past the entrance to the Mulatas Channel, and, after hauling around Maria Aguilar Point, keep close along the shore till the town bears about east, when the bay will open out. Ciriolas Point, the southern limit of the bay, should be passed at a distance of 300 yards, and a good berth will be found in 8 fathoms with this point bearing S. 3° W. (south mag.).

Although the bay appears roomy, there is only room for one vessel, the bottom being strewn with rocks, on some of which there is only 6 feet of water. This place will be found a convenient anchorage for communicating with Trinidad, as it will be only necessary to pull 3 miles up the river as far as a bridge, which lies only $\frac{1}{2}$ mile from town.

PROVINCE OF PUERTO PRÍNCIPE.

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ALTA GRACIA.

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PROVINCE OF PUERTO PRÍNCIPE.

LOCATION AND BOUNDARY.

This province was formerly known as Camaguey and forms the Central Department, the most extensive yet the least populated of all. Popularly this region is termed partly "Tierra Adentro" and partly "Las Cinco Villas"—the five towns. In its ecclesiastical conception Puerto Príncipe belongs to the archbishopric of Santiago de Cuba.

Puerto Príncipe is bounded on the north by the Canal Viejo de Bahama; on the south by the Sea of the Antilles; on the east by Santiago de Cuba, and on the west by the Province of Santa Clara.

AREA AND POPULATION.

The area is 11,428 square miles; the length 160 miles; width, 100 miles. It contains 2 cities, 1 town, 2 villages, and 68 hamlets and suburbs, besides 6,500 rural estates with an entire population of 55,459, one-fourth of which are colored and three-fourths white.

ADMINISTRATION.

It is a third-class province, with a civil and military government and a naval command, a criminal court, an administration of finance and of roads and communications, a provincial deputation, 5 alcaldes (mayors), 2 vicars, and 4 parishes. There are two judicial districts, corresponding to the courts of first instance or inquiry. They are Puerto Príncipe and Morón. The municipal courts are Puerto Príncipe of Puerto Príncipe; Nuevitas and Santa Cruz del Sur of Morón and Ciego de Avila. The capital of the naval district is Nuevitas, on the northern coast.

PUBLIC INSTRUCTION.

There is in Puerto Príncipe 1 college with 144 students. There are 1,542 pupils attending 40 municipal or public schools of the province, besides 37 private schools. Instruction is compulsory, but the law is ignored. Schools of fine arts are

much more frequented than the industrial schools. Puerto Príncipe is the birthplace of the two brilliant authors, Mme. La Arellanada and Betancourt Cisneros, also of some of the heroes of the late civil war.

AGRICULTURE.

Plantations of sugar and tobacco of some magnitude occupy the fertile country surrounding the quaint old capital of Puerto Príncipe; fine pasturage is afforded the numerous flocks and herds for which this province was formerly noted, but which have been greatly decimated as results of the late war. A limited amount of vegetables are cultivated and considerable fruit is grown, of which the Guayara figures prominently.

The most extensive forests of the island, here located, produce valuable woods, including cedar, ebony, and mahogany, while copper and other minerals are found in the mining districts.

INDUSTRY AND COMMERCE.

The preserving of fruit, the mining of copper and other metals, and of marble, etc., and cutting of wood for building purposes, and cattle raising are the chief industries; the commerce of the province consists chiefly in the exportation of these articles and of meat and the importation of foreign comestibles and manufactured goods, carried on from the Port of Nuevitas, Morón, La Guanaja, and Santa Cruz del Sur. Fishing is good on the coasts.

GEOGRAPHY AND TOPOGRAPHY.

The mountainous character of the country east begins to be modified in Puerto Príncipe. There are few ranges, only detached groups appearing here and there, the ranges gradually dipping into the plains. The principal groups and ranges follow: Camagueyano, Najaza, Sevilla, Guaicanamar, Charrito, Sierra de Judas, and Cubitas. Cubitas is celebrated for its beautiful and marvelous caves (the principal ones are known as Cubitas and Resolladero Guacanaya), and as the seat of the Cuban Government. Other elevations are little more than hills. Springs are frequent, especially in the south. Many rivers flow north into the channel of Bahama and south into

the Sea of the Antilles. The soil of the interior is rich, the coasts low and marshy. There are but two lakes, viz: Morón and Grande.

RIVERS.

There are many rivers and streams in Puerto Príncipe, the principal ones on the north being:

Río de las Cabrerías—rises in the eastern portion of Puerto Príncipe, flows north, forming a boundary line between this province and Santa Clara, and empties into the Bahama Channel near Point Nuevas.

Río Jigüey—rises in the Sierra de Cubitas, flows north, and empties into the channel separating the Cay of Romano from the mainland.

Río Cuanado—rises in the central portion of the province, flows north, and empties into the channel near Point Caunao.

Río de la Yama—rises in the west central portion of the province, flows north, and empties into the channel near Boca de la Laguna.

Río de Incara—rises in the mountains of the western portion of the province, flows north, and empties into the bay opposite Triguano Island.

Río de Perros—rises in the mountains of Jatibonico, flows north, and empties into the sea near Rivero Point.

The principal rivers on the south are:

Río de Jababo—rises in the east central portion of the province, flows east and then south, forming the boundary line between Santiago de Cuba and Puerto Príncipe, and empties into the sea opposite Tamayo Cay.

Río de Sevilla—rises in the Sierra de Najaza, flows south, and empties into the sea opposite the cays of Sevilla.

Río de San Juan ó de Najaza—rises in the mountains of Najaza, flows south, and empties in the sea near Santa Cruz del Sur.

Río de Santa Clara—rises in the east central portion of the province south of Puerto Príncipe, flows south, and empties into the sea east of Boca de Santa María Casimba.

Río Altamiras—rises in the east central portion of the province, flows south, and empties into the Boca de Santa María Casimba.

Río San Domingo Díaz—rises in the central portion of the province, flows south, and empties into the sea opposite Ana María Cays.

Río Grande—rises in the Sierra Jatibonico in the western portion of the province, flows south, and empties into the sea opposite Palo Alto Cay.

Río Nuevas—a short stream—rises in the eastern portion of the province, flows south, and empties into the sea near the boundary line on the west.

Río Jatibonico—rises in the mountains of the same name, flows south, forming the boundary line between Santa Clara and Puerto Príncipe, and empties into the sea on the south.

Río Limones, the entrance to which, about 8 miles to the northeast of Cape Cruz, is bordered by two lines of reefs, is at least 5 feet deep, and is navigable for boats to a distance of 3 miles, as far as the landing stage known as Marca de Limones.

Río Zarza, which empties close to the east side of Zarza Point, is navigable for canoes for some distance, and communicates with the town of Sancti Spíritus, 26 miles inland. The water, however, is not fit for use until 24 miles from the mouth.

COAST LINE.

Salty lagoons, reefs, and shoals, capes and points, cays and gulfs, and bays, vary the outline of the coast, which is generally low. Shells and seaweed, beautiful and entirely peculiar to these coasts, are found in the bordering waters, and these waters display hues of color not only lovely, but beyond the most fanciful imagination. Lighthouses are conveniently placed at points of warning. There are a few small islands not far distant on the north. From Nuevitas westward is a line of breakwaters named by Columbus "The King's Garden." From Cape Cruz to Trinidad on the south the shore is fringed by the archipelago "Los Jardines de la Reina," which inclose the Laberinto de las Doce Leguas (the twelve-league labyrinth) and the Bank of Good Hope. These portions of the coast are covered with thick groves of mangroves and other tropical swamp flora, among which are hidden lakes of fresh, salt, or brackish water, rising in the midst of a perpetual verdure.

CAPES, POINTS, AND PENINSULAS.

The principal capes and points of Puerte Príncipe are San Juan, Tinaja, Salina, Marcelina, Cannar, Guaui, Curiana, Brava, Pilotos, Viaro, Rincón Grande, Arenas Martinillas,

Ebano, Practicos, Muertos, Granado, and Arenas on the northern coast, and Curua, Juncos Iguano, Macurijes, Perro, Santa Maria, Muertos, Júcaro, Carapacho, and Palo Alto on the southern coast. There is the peninsula of Sabinal in the north.

BANKS, REEFS, CAYS, AND SHOALS.

The principal ones of Puerto Príncipe on the north are as follows:

Cay Romano is inside the chain of cays and reefs, and separated from the Cuban shore by a sort of shallow lagoon. It is mostly covered with a mangrove swamp and divided in two by a narrow inlet.

On the eastern end of Cay Romano is a remarkable hill. At the foot of this hill, called the Silla de Romano, on the beach, will be seen two fishing stations.

There is a smaller hill 16 miles to the NW., and only 100 feet high, called the Alto de Aji. Another similar hill, near the NW. extremity of the cay, is called Juan Saez.

The bottom between Cay Romano and the Cuban shore is of olive-colored mud, covered with weeds.

Cay Verde is a small, low, islet, of a circular form, and 200 yards in diameter, covered with bushes to the height of 10 feet above high water; and inside the reef, N. by E. of the Cay Guajaba, there is an opening through which 10 feet of water may be carried, and $\frac{1}{2}$ mile SW. of Cay Verde there is shelter for vessels of this draft against northers. The best channel to take is that round the north end of the reef, about $1\frac{1}{2}$ miles from the cay; but it requires good local knowledge of the place to enable a vessel to thread her way safely through the shoals.

Cay Confites is a low cay, and lies close on the edge of soundings. On its south end there is a pile of stones, and near the north end a solitary tree, which is the first object seen when coming from the SE. Off the north end a dry reef extends to the distance of 1 mile, leaving a small channel 12 feet deep between it and the cay. A dry reef also extends from the south end.

Cay Cruz is about $11\frac{1}{2}$ miles long, in a NW. and SE. direction, very low and flat, with a sandy shore, and at its NE. point there is a remarkable clump of trees, 30 feet high. A mile WNW. of the clump of trees is a sand bank, which is

only seen when near it. The cay is divided in the center by a small cut, and abreast it on Cay Romano there is the remarkable hummock called the Alto de Aji. Between these two cays there is only a foot of water at low tides, and the bottom is like pipe clay.

TRIBUTARIOS DE MINERVA REEF.—About $\frac{1}{2}$ mile within the edge of soundings, 2 miles north of the north end of Cay Cruz, lie the Tributarios de Minerva, a reef on which the sea breaks with fresh breezes, and which uncovers at low tide. In a WNW. direction from this reef are numerous others, with but little water on them, and near the edge of soundings. The edge of the bank between Cay Confites and the Tributarios de Minerva runs NW. in a straight line for $14\frac{1}{2}$ miles, and may be seen from aloft, the white sandy bottom showing itself distinctly just within the edge of the bank, which is very steep-to. This part is extremely dangerous, and should be approached very cautiously, as there is no safe anchorage whatever.

CAIMAN AND ANTON CAYS.—About 4 miles NW. of Cay Cruz lies Caiman Cay, higher than others in the vicinity; and about 3 miles farther, at Sandy Cay, begins a chain which extends in a NW. by W. direction for 9 miles to Anton Cay, and thence to Paredon Grande Cay, all skirted by shallow banks without anything particular to recognize.

PAREDON GRANDE CAY.—The space between Caiman and Paredon Grande Cays is interrupted by low cays, sand banks, and reefs. From the Tributarios de Minerva the edge of the bank takes about a NW. by W. direction for 18 miles, when it comes within 2 miles of the north end of Paredon Grande Cay, which is about 5 miles in length east and west, rocky, wooded, and about 40 feet high. Guinchos (or Ginger) Cay, on the edge of the Bahama Bank, bears from the north point of Paredon Grande N. 8° E. (N. 6° E. mag.) 16 miles.

Light.—On the northern part of this cay is an iron structure, white with a brown base, on a foundation of rock, from which is exhibited a fixed and flashing light, flash every minute, 156 feet above the sea, and visible about 19 miles.

Water.—The only good water to be obtained at any of these cays is from a few springs or wells. In some places by digging in the sand it may be found, but is generally brackish.

Tides.—The stream of tide sets right on and off the bank about half a knot an hour, but in the openings between the

cays it runs from 2 to 3 knots. It is high water, full and change, at 7h. 30 m., and the rise at springs is 3 feet. Between the cays and the main the rise is not more than a foot, and the stream is scarcely perceptible.

CAY COCO.—Five miles SW. by W. of Paredon del Medio is ~~the~~ northwestern part of Cay Romano, separated from Cay Coco by a channel $\frac{1}{2}$ mile wide and nearly 4 feet deep. Cay Coco is of moderate height, with various sandy places on the northern part, and ~~the~~ southern part extends westward covered with mangroves to southward of Guillermo Cay. Three-quarters of a mile northward of ~~the~~ east end of Cay Coco is Queche, a small flat cay covered with mangroves. Westward of Paredon del Medio, shoals extend almost continuously to the NE. part of Cay Coco.

JAULA, GUILLERMO, AND SAN FELIPE CAYS.—Four miles westward of Coco Point is Jaula Cay. WNW. of Jaula there are three other small cays named San Felipe, the smallest distant 4, the next 6, and the most western 7 miles. Guillermo Cay lies west 6 miles from Jaula Cay, and extends $5\frac{1}{2}$ miles ESE. and WNW.; its western part is of moderate height.

Media Luna Cay is flat and bordered with reefs on its southern and western sides. N. 79° W. (N. 81° W. mag.) of the cay, and lying on the edge of the bank of soundings, are two shoals. South of these shoals and of San Felipe, Media Luna, and Santa Maria Cays, there is a channel from Point Coco to the anchorage of Cay Frances for vessels drawing not more than 9 feet.

South of Guillermo Cay, and extending from the west end of Cay Coco, is a group of 13 cays laid down on the charts, the names of which are not given. From Cay Coco they curve around to the south and west, the curve being open to the eastward.

The Hijos Guillermo are three cays of small extent, surrounded by a reef, and lying $1\frac{1}{2}$ miles WNW. from Guillermo Cay.

SANTA MARIA CAYS.—About WNW. of Media Luna Cay is the chain of small cays of Santa Maria, the eastern of which is 8 and the western 14 miles from it.

Close westward of this last group is Caiman Cay, SW. of which again is Santa Maria Cay, which is of regular height, and extends 6 miles east and west.

Light.—It is intended to establish a light on Caiman Grande. As soon as the plans are completed the construction of the lighthouse will be commenced.

Approximate position of Caiman Grande Cay, latitude $22^{\circ} 40' 30''$ N., longitude $78^{\circ} 56' 00''$ W.

CAY FRANCES.—About $7\frac{1}{2}$ miles S. 82° W. (S. 79° W. mag.) of Santa Maria Cay is the east end of Cay Frances, which is of regular height and 3 miles in extent. On its north side are seen, extending east and west, three round hills, two joined together, and the third somewhat separated, which are called the nipples of Viuda. The paps of Buena Vista and Mount Guajabana will also be observed; the former bears about S. 37° W. (S. 34° W. mag.) from the west end of the cay, and the latter S. 49° W. (S. 46° W. mag.). On the west point of the cay, which is low and rocky, are several pilot houses. The point is surrounded by a sand bank which extends westward, and to the SW. for nearly a mile; a mile westward of the point the depth is 5 fathoms; a red buoy (not to be depended upon) is placed in 6 feet water, about 300 yards within the southern edge of this bank.

Light.—On the western end of Cay Frances is a lighthouse, from a mast at the NW. end of which, at an elevation of 60 feet, is exhibited a fixed white light visible 15 miles.

The Carenero Cays, two in number, lie east of the entrance to the anchorage, and to the westward are two others called Pinipiniche. From the anchorage the houses of the town bear from NE. to NW.

The Eastern Channel lies between the easternmost of the Doce Leguas Cays and an extensive bank, on the western part of which are the Uvero Cays.

To enter this channel from outside, steer north, giving a berth of 1 mile to the reef which forms the eastern side of the channel. When abreast of the white sand bank, haul up N. 25° E. (N. 22° E. mag.) and pass through a group of three cays, leaving two of them to the eastward, and carrying a depth of 11 to 12 fathoms of water. After passing these three cays steer toward the easternmost of the Pilon, a group of four islets extending WNW. and ESE. When within 1 mile of this latter cay the Mate Channel will be seen, to enter which, bring the north point of the easternmost Pilon Cay to bear N. 55° W. (N. 58° W. mag.) and steer S. 55° E. (S. 58° E. mag.).

A better, because easier, course is to pass between the eastern Pilon Cay and the Mate Cays, and rounding the latter to the northward, pass between them and the coast of Cuba. In both of these channels the depth is 16 feet.

To the eastward of the Mate Cays keep the coast aboard, carrying about $5\frac{1}{2}$ fathoms of water till about $\frac{1}{2}$ mile to the southward of the Pinipiniche Cays, when the town will be seen and anchorage will be found, as before stated.

Outside the cays the soundings are regular and vary from 8 to 20 fathoms. On the edge of the bank the bottom is generally rocky, but inside of a depth of 10 fathoms vessels may anchor temporarily on sandy bottom.

Tides.—It is high water, full and change, at Santa Cruz at noon, and the rise is 4 feet; but the tides are greatly influenced by the strength of the wind.

Laberinto de Doce Leguas, or Twelve-League Labyrinth, is a range of low, bushy cays, with sandy beaches, extending in a WNW. and ESE. direction 70 miles. They are steep-to; the lead is therefore no guide and in the night they should be given a wide berth. The easternmost islet, which lies N. 42° W. (N. 45° W. mag.) 56 miles from Cape Cruz, and Cay Breton, the westernmost, are 15 and 25 miles from the mainland, but in the center they are nearly 30 miles from the nearest shore. The space within, called the White Ground, from its clear, white sandy bottom, is studded with small islets, with deep water between them.

There are several channels leading through the outer cays for vessels of about 14 feet draft, but a pilot is necessary, and one may be obtained at Cape Cruz or from the Caiman turtling vessels, which are generally to be met with in the neighborhood. The principal openings are Eastern Channel, at the extreme east end of the range; Caballones Channel, 38 miles to leeward of this, and Boca Grande, 22 miles farther; and being wide they can be easily recognized.

Bank Inside the Laberinto de Doce Leguas.—This extensive tract has generally depths of from 5 to 12 fathoms, over a very soft, white marly bottom, the mud from which almost always discolors the water and greatly adds to the dangers of the pilotage. The whole space is covered with groups of low cays, very inaccurately laid down on all charts, and their names are in much confusion.

The channel east of Burgado Cay is so full of coral shoals as not to be fit for use.

Caballones Channel, or Boca de Caballones, is the easternmost of the channels through the Doce Leguas Cays for vessels larger than boats. It is easily recognized, being 2 miles wide, while none of the openings to the eastward have a greater width than $\frac{1}{2}$ mile. At a distance of 1 mile to the westward of this channel is a cocoanut tree. Most of the trees on these cays are a sort of dwarf palm; the cocoanut is seldom seen. There are only $2\frac{1}{4}$ fathoms of water in this channel, and the same depth is found to the SW. of the entrance, from each side of which reefs extend, narrowing the channel to 400 yards in width. No good marks can be given, and the eye will be the best guide.

After passing this narrow place the depth of water increases to 9 and 10 fathoms.

The inside western point of the channel is called Black Mangrove Point, and bears north (N. 3° W. mag.) of Pilot Point, the outer eastern one. This channel is one of the best fishing grounds on the south side of Cuba. An abundance of fish can be caught either by trolling or bottom fishing or by hauling a seine. The beach on the western side is also frequented by turtles.

Directions.—After entering, a north (N. 3° W. mag.) course will lead between Bergantin and Manuel Gomez Cays. The first of these lies 6 miles north of the east end of Caballones or Llana Cay, which forms the western side of the channel. From these cays a N. 8° W. (N. 11° W. mag.) course for 18 miles will carry the vessel up to the NE. end of the Yagua Reef, and from here a N. 43° W. (N. 46° W. mag.) course for 18 miles farther leads to the mouth of the Jatibonico River. The aid of a pilot will be necessary for a stranger.

LEVIZA CAY.—A mile northward of Dios Cays is the middle of Leviza Cay, and in this space, reduced by a reef which extends 400 yards from the south side of the latter, the channel carries $1\frac{1}{4}$ to 2 fathoms water, over mud. Leviza Cay extends 2 miles east and west, and is divided into two by a narrow channel, fit for boats; its north part is firm land, but its southern marshy.

Nearly $2\frac{1}{2}$ miles SE. of Leviza Cays is the entrance to the Puercos River, but the water is not good.

ALACRANES POINT AND CAYS.—At $2\frac{1}{2}$ miles N. 83° E. (N. 79° E. mag.) of Leviza Cay is Alacranes Point, with several cays near it, named Casigua and Alacranes, which

are separated from each other by small channels used by canoes. Alacranes Cay lies a little eastward of the pass of the same name, and separated from the reefs by a channel a mile in breadth and 6 or 7 feet deep, named the Reduan Pass. The north part of this cay is firm land, and the southern covered with mangroves. It is separated from the coast by a channel $\frac{1}{2}$ mile in breadth and about 2 feet deep.

LEVIZA PASS.—The outer edge of the reef passes $1\frac{1}{2}$ miles northward of Leviza Cay, and after forming on the west the pass of that name, which has but little water, trends about NE. by E. 4 miles to Alacranes Pass; thence, leaving a space of about a mile between it and Alacranes and Casigua Cays, NE. by E. 3 miles, and then E. $\frac{1}{2}$ N. 4 miles farther to Blanco Cay Pass.

Alacranes Pass carries only about 6 feet water, and lies with the eastern part of Leviza Cay bearing about S. 26° W. (S. 22° W.). Vessels of 6 feet draft enter and quit this pass regularly, and sail between the reef and coast as far as Jutias Cay. Four miles N. 83° E. (N. 79° E. mag.) of Alacranes Point is the small Cay Ratones, and 2 miles N. 71° E. (N. 67° E. mag.) from the latter is Blanco Cay, also very small, and only seen from the reef.

The Berracos are two small, low cays, joined to the coast by a reef, preventing the passage of boats and sheltering the anchorage of Berracos Bay. The channel leading to this anchorage has a depth of from 9 to 16 feet, gradually diminishing toward the shore.

Arenas Cay, north of the Berracos, is separated from the reefs outside by a channel 500 yards in width, navigable for boats only; its southern portion is swampy. There is a short reef extending from its SW. point.

Dios Cays are two small, swampy islets lying east $\frac{1}{4}$ mile from Purgatorio Point and very near the coast.

Inés de Soto Cay extends NE. and SW. $4\frac{1}{2}$ miles; its northern part is firm land, but the southern is marshy. Seen from the northward the cay appears to be divided by a small channel, which is an inlet only 300 yards in extent; 400 yards off Gallegos, the NW. point, is a mud bank with about one fathom water on it, which extends 200 yards east and west, and 100 yards in breadth. Between this shoal and the outer reefs is the channel, nearly a mile wide and $1\frac{1}{2}$ fathoms deep, and which is used by coasters.

San Cayetano Bay is formed on the west by Inés de Soto and Legua Cays, and on the east by Lavandera Point. On the shore there are several storehouses for copper ore, and a wooden pier. It is clear of danger, and the bottom mud. In proceeding for this bay it will, however, be necessary to guard against a reef which extends 800 yards SE. from the east point of Inés de Soto Cay. The best berth is in 2 fathoms water, with the east point of Inés de Soto Cay bearing N. 41° W. (N. 45° W. mag.) and Lavandera Point N. 26° E. (N. 22° E. mag).

GULFS, BAYS, AND ANCHORAGES.

The only important gulfs and bays of this province are the bays of Jiguay and Sabinal, on the northern coast, and the Gulf of Ornofay and Bay of Santa María, on the southern coast. The fort of Nuevitas is the best and largest harbor, situated on the north coast.

Between the dry reef, near the south end of Cay Confites and the reef running off to the northward of Cay Verde, there is a clear channel carrying a depth of 5 fathoms, and leading into anchorage under Cay Confites in from 2 to 4 fathoms of white sand. The best sheltered berth is with the cay bearing N. 45° E. (N. 43° E. mag.) about a mile off, or nearer, according to the vessel's draft. It should be observed, however, that with the wind to the southward of east a heavy roll of the sea sets in round the south end of the cay. This is the only anchorage on this side of the Bahama Channel, between Nuevitas and Paredon Grande Cay, where a vessel drawing more than 12 feet can ride out a Norther in safety.

In passing through the channel between Cay Verde and Cay Confites, keep a little closer to the latter than the former. When the middle of Cay Confites bears N. 38° W. (N. 40° W. mag.) and Cay Verde S. 11° W. (S. 9° W. mag.), a vessel will be on the edge of the bank of soundings, or nearly so. Then steer N. 68° W. (N. 70° W. mag.) till the south end of Cay Confites bears north (N. 2° W. mag.); thence the course is about N. 30° W. (N. 32° W. mag.) till the southern end of Cay Confites bears N. 45° E. (N. 43° E. mag.), where the anchor may be let go in 3 to 4 fathoms of water; sandy bottom.

In quitting this anchorage, if the wind does not permit a vessel to leave by the SE. channel, steer to the NW. until clear of the reef extending from the north end of the cay.

PAREDÓN DEL MEDIO.—To the NW. of Paredón Grande and close to it is Paredón Chico, a round cay of regular height; and $2\frac{1}{4}$ miles west of the latter is another similar cay, 25 feet high, named Paredón del Medio. These cays afford shelter with the wind from NE. to east for vessels of 9 feet draft, but with the wind from NNE. it is necessary to leave the anchorage in consequence of the heavy sea which sets in. The Paredón del Medio is foul on the north and east, and a vessel can not pass inside it. About half-way between the two Paredóns lies a bank on which the sea generally breaks.

Between Cay Confitas and Paredón Grande there is no anchorage, as throughout, the space is full of shoals not sufficiently large to afford shelter. The bank should not be approached closely without purpose.

From Paredón Grande, the edge of the bank takes about a WNW. direction for 50 miles, and is then about 4 miles northward of Santa María Cay. This part of the coast is very little known; it is dangerous, and affords no anchorage whatever to any but small coasters, that are well acquainted with it. The bank next trends WSW. 10 miles, its edge continuing nearly the same distance from the outer cays.

At the northern part of Cay Coco is the port of the same name, sheltered with northeasterly winds, formed by Jaula Cay, and a small reef which unites it to Cay Coco. This anchorage is exposed to northerly winds.

Cay Frances Anchorage is, however, only a narrow vein of deeper water about $\frac{1}{2}$ mile wide and running east and west. In standing in keep the paps of Buena Vista well open to the westward of Herradura Cays and Cobos Cay till the SW. end of Cay Frances bears S. 67° E. (S. 70° E. mag.). Then haul round the sand bank and anchor with the flagstaff bearing north (N. 3° W. mag.) and a small white cliff on the west side of the cay bearing N. 79° E. (N. 76° E. mag.).

In beating in for the anchorage do not stand to the northward into less than $3\frac{1}{2}$ fathoms, as the bank is steep-to. To the southward, toward Cobos Cay, a vessel may safely go into 3 fathoms. Around Cay Frances there is an abundance of excellent oysters.

There are several excellent harbors or lagoons formed by the cays of the Labyrinth of the Twelve Leagues, in which a hurricane might be weathered, but they can not be found without a pilot.

In many portions of this bank there are shoals of branch coral rising to the surface of the water from a depth of from 5 to 12 fathoms. By sending a boat ahead to sound a steamer may be navigated among them, but not without risk. From a point 5 miles north of the Boca Grande to within 10 miles of the Cuban Coast these dangers are very thick.

Anchorage.—Good anchorage for small craft is 1 mile north of Pilot Point, with a depth of $2\frac{1}{2}$ fathoms, sheltered from all winds except those from south to WNW., which are very rare. Should the wind come out from these unusual directions a vessel can easily find shelter under one of the cays.

Pilots.—Some fishermen, who are always ready to act as pilots, live about $\frac{1}{2}$ mile eastward of Pilot Point.

Palomas or Brigand Cay Anchorage is one of the best of the anchorages in this vicinity. It is 15 miles N. 8° W. (N. 11° W. mag.) of the Boca de Caballones. The outside anchorage is in a large bay formed by a semicircular chain of reefs and cays, and which may be entered from the north or west without danger. It is well sheltered from SW., round by south to NNE.

A good berth will be found $\frac{3}{4}$ mile N. 11° W. (N. 14° W. mag.) from a small sandy cay on the reef which joins the most western of the cays with the rest of the group. There are 7 fathoms of water, with good holding ground. If, however, a more sheltered anchorage is desired it will be found in the lagoon inside, having an entrance open to the eastward, through which a depth of 3 fathoms may be carried. This inner anchorage is completely surrounded by reefs and cays, and lies in latitude $21^{\circ} 06' N.$, longitude $78^{\circ} 56' W.$ As the charts of this region are not at all trustworthy, the cays surrounding this anchorage may or may not be the Palomas Group.

RAILWAYS.

Puerto Príncipe has only two railways, with a total trackage of about 88 miles. These railways are:

1. From Puerto Príncipe to Nuevitas, 50 miles, single track, standard gauge, belonging to the Ferrocarril de Puerto Príncipe-Nuevitas.
2. From Júcaro to Morón, 38 miles, and an extension of 2 miles to Estero, single track, standard gauge, called the Morón-Júcaro Trocha Railway, and is at present operated by the Government as a military road, guarding the Morón-Júcaro Trocha. It is open to the public to a certain extent.

1. PUERTO PRÍNCIPE-NUEVITAS RAILWAY.

TABLE OF DISTANCES.

PUERTO PRÍNCIPE									
16	ALTA GRACIA.								
22	6	LAS MINAS.							
23	7	1	AQUADA JOSEFINA.						
29	13	7	6	RAMBLAZO.					
41	25	19	18	12	BUENA VISTA.				
44	28	22	21	15	3	VILLA NUEVA.			
50	34	28	27	21	9	6	NUEVITAS.		

ITINERARY.

Leaving Puerto Príncipe this road passes through a fairly level country well watered, fertile, and well populated, crossing over many small culverts and trestles. At a distance of 22 miles it enters the village of Las Minas. On the south of the railway is a small ridge. Distances from Puerto Príncipe. 22 miles.

From here the road traverses a low flat country which soon becomes almost swampy, but grows higher again and more rolling until just before the village of Villanueva is reached a range of hills is skirted on the south of the tracks. After passing them the road enters the village above mentioned, where a small branch extends to Almendares. The road from Villanueva turns south, and, traversing a flat unsettled region, enters Nuevitas, its terminus, 50 miles from Puerto Príncipe. 44 miles.
50 miles.

2. JÚCARO-MORÓN RAILWAY.

TABLE OF DISTANCES.

JÚCARO.									
6	DOMINGUEZ.								
16	10	ÁVILA.							
29	23	13	SANDOBAL.						
38	32	22	9	MORÓN.					
40	34	24	11	2	ESTERO.				

A full description of this road is given under the title of "Trochas." Page 32.

ROADS.

Puerto Príncipe has a great number of roads, the most important ones being:

1. From Remedios to Morón, a distance of 75 miles, of which 28 miles are in the Province of Puerto Príncipe.
2. From Puerto Príncipe to Sancti Spíritus, a distance of 130 miles, of which 100 miles belong to the Province of Puerto Príncipe.

3. From Morón to Puerto Príncipe, a distance of 77 miles.
4. From Puerto Príncipe to Las Tunas, a distance of 92 miles, of which 65 miles are in the Province of Puerto Príncipe.
5. From Puerto Príncipe to Santa Cruz del Sur, 55 miles.

1. REMEDIOS-MORÓN ROAD.

[For Table of Distances and Itinerary, see Santa Clara Province.]

2. PUERTO PRÍNCIPE-SANCTI SPÍRITUS ROAD.

TABLE OF DISTANCES.

PUERTO PRÍNCIPE.

19	YEGUAS.		
29	10	SAN JERÓNIMO.	
72	52	42	CIEGO DE ÁVILA.
82	60	50	10 JICOTEAS.
130	106	96	54 46 SANCTI SPÍRITUS (SANTA CLARA PROVINCE.)

ITINERARY.

Distances from
Puerto Príncipe.

Leaving the city of Puerto Príncipe and running west the road traverses a vast rolling plain, whose soil is fertile and much cultivated. Many small creeks are crossed and signs of habitation are numerous. At a distance of 19 miles the village of Yeguas is reached.

Beyond here the road continues to traverse a rich, fertile region, passing through the town of San Jerónimo and thence to the village of Ciego de Avila.

From here the country is not so thickly populated and the land is less cultivated, few signs of civilization being seen until Jicotea is reached.

After leaving Jicotea the road continues to traverse a vast rich plain, little signs of habitation being noticed, with the exceptions of now and then a few huts, until near its destination—Sancti Spíritus—130 miles from Puerto Príncipe.

3. MORÓN-PUERTO PRÍNCIPE ROAD.

TABLE OF DISTANCES.

MORÓN.

45	MAGARABOMBA.		
58	13	EL MULATO (CAOBILLAS).	
77	32	19	PUERTO PRÍNCIPE.

ITINERARY.

Commencing at Morón, this road runs in a southeasterly direction across an immense plain, fertile and well watered, but thinly populated and little cultivated.

About 25 miles from Morón it fords a stream and ascends and crosses over a range of hills into the valley beyond, and, after traversing a dreary waste, enters the village of Magarabomba.

Distances from
Morón.
25 miles.
45 miles.

Beyond here the country becomes more rugged and undulating, the road running parallel to a range of hills on its right for some distance. Shortly before reaching the village of El Mulato, the road divides, the left-hand road going to Puerto Príncipe, while the other is a shorter route, though it passes through a less populated region. It enters Puerto Príncipe at a distance of 77 miles from Morón.

58 miles.

77 miles.

4. PUERTO PRÍNCIPE-LAS TUNAS ROAD.

TABLE OF DISTANCES.

PUERTO PRÍNCIPE.

37				SIBAÑICU.					
43	6			CASCORRO.					
60	23	17		GUAIMARO.					
79	42	36	19	MELONES.					
92	55	49	32	13	LAS TUNAS.				

} Santiago de Cuba Province.

ITINERARY.

Leaving Puerto Príncipe in a southeasterly direction, the road passes through a fertile well-watered rolling plain, much inhabited and cultivated, with little variation in topography or scenery, passing through Sibanicu, and entering the village of Casano, 8 miles distant.

Distances from
Puerto Príncipe.

37 miles.

From here the road takes a more southern direction, passing a range of hills to its right, and finally entering the town of Guimaro.

43 miles.

60 miles.

Beyond Guimaro the road continues to traverse a vast rolling plain, passing the village of Melones and thence to its terminus, the city of Las Tunas. Here it connects with a road leading to Holguin, which will be taken up separately under the Province of Santiago de Cuba.

79 miles.

92 miles.

5. PUERTO PRÍNCIPE-SANTA CRUZ ROAD.

TABLE OF DISTANCES.

PUERTO PRÍNCIPE.

4									
12	8								
17	13	5							
29	25	7	2						
36	32	24	19	17					
51	47	39	24	22	5				
55	51	43	38	36	19	14			

SANTA CRUZ DEL SUR.

JUDICIAL DISTRICTS, TOWNSHIPS, **CITIES**, AND TOWNS.

Judicial district (partido judicial).	Township (ayuntamiento).
Morón	{ Ciego de Ávila. Morón.
Puerto Príncipe	{ Nuevitas. Puerto Príncipe. Santa Cruz del Sur.

I. JUDICIAL DISTRICT OF MORÓN.

Population, 17,630.

Townships.	Population.
1. Ciego de Ávila	9,000 (7,800 white and 1,200 colored).
2. Morón	9,890.

1. AYUNTAMIENTO OF CIEGO DE ÁVILA.

Capital, Ciego de Ávila.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Arroyo Blanco	27	Route: From Habana to Batabanó by rail, then to Júcaro by sea.
2. Ceiba	10	
3. Guanales	13	
4. Iguaará	3	
5. Jicotea	9	
6. Júcaro	17	
7. Lázaro Lopez	10½	
8. Nuevas (Las)	26	
9. Nuevas de Jobosi	42	
10. San Jerónimo	62	
11. San Nicolás	26	
12. Soledad	41	
13. Yeguas	68	

CIEGO DE ÁVILA is a jurisdiction situated 18½ miles from Morón. Central point of the military trocha. It has an infantry barracks, engineer office, and military hospital. The nearest station is Júcaro, 17 miles away. Post office and telegraph station.

The village is on the Júcaro-Morón trocha, near the northern coast, and is on the highroad to the city of Puerto Príncipe, being 65 miles west of the latter. It is a damp, unhealthy place, but yellow fever is not prevalent here. Out of 3,840 admissions to the military hospital in 1873 there was not a single case of yellow fever, and of 9,591 admissions in 1874 there was only one.

2. AYUNTAMIENTO OF MORÓN.

Capital, Morón.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Cabezas	12	A colony sometimes called "Infanta Isabel." Telegraph station.
2. Chambas	17	
3. Guadalupe	28	
4. Marroquín	17	
5. Punta Alegre	22	
6. Piedras (Las), or Sandoval	9	
7. Ranchuelo	5½	
8. Santa Gertrudis	18	

ROUTES.

From Habana to Batabanó and Júcaro, then over the Morón-Júcaro Military Railroad.

MORÓN is a town of 3,017 inhabitants, situated near the northern shore, 109 miles from Puerto Príncipe. Morón is near the Cimarrones River, at the termination of calzada to Santa Clara and Habana, and also on the Júcaro-Morón trocha. It has a military barracks, Spanish casino, police force, and a printing establishment. Railroad of the military trocha. Telephone, post office, and telegraph station.

II. JUDICIAL DISTRICT OF PUERTO PRÍNCIPE.

Townships.	Population.
1. Nuevitas	
2. Puerto Príncipe	
3. Santa Cruz del Sur	4,016

1. AYUNTAMIENTO OF NUEVITAS (SAN FERNANDO DE).

Capital, Nuevitas.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Bagá	$\frac{1}{2}$	
2. Mayanabo	$\frac{1}{2}$	
3. Nuevas Grandes		
4. Pastelillo	$\frac{1}{2}$	
5. Sabinal	2	
6. San Miguel	12	2,000 inhabitants.

BAGÁ.—This village, located about 5 miles south of Nuevitas, on the southern extremity of the harbor, was reported to have a population of 102 in 1877. A railroad starts here and runs $5\frac{1}{2}$ miles to the inland village of San Miguel.

ROUTE TO NUEVITAS.

By sea from Habana, Cárdenas, or Matanzas.

NUEVITAS (San Fernando de), a city of 6,991 inhabitants, capital of the old political district of the same name, is situated 49 miles from Puerto Príncipe. It has a military command, a board of public education, a charitable organization, and a board of health; four public city schools, two for each sex, a church, a military hospital, a union of labor organizations, a club (San Fernando) and a house of mercy. It has eight aldermanic districts and two rural districts, one at San Miguel and another at Bagá. The harbor of Nuevitas was the first place in Cuba visited by Columbus, October 28, 1492. Post office and telegraph station.

Nuevitas is on the north coast between the two other ports of entry, Remedios and Gibara, and is located on the west bank of the large harbor of Nuevitas, some 15 miles to the open sea. It rises in terraces, so that the upper town has an elevation of about 130 feet. The soil of which Nuevitas is built is in part rocky, but more generally clayish in character, so that some of the streets in rainy weather are almost impassable. This town is chiefly of importance because it is the seaport of Puerto Príncipe, the largest inland city of Cuba. Nuevitas is connected with Puerto Príncipe by a railroad which runs 45 miles southwest. A steamship line which connects with other Cuban ports, stops at this place at least three times a month. The climate is healthful, although during the prevalence of north winds endemic fevers prevail, and as there are no swamps in the neighborhood the cause can be attributed only to the existence of pits dug by the inhabitants for the purpose of storing away water which is very scarce in the dry season. The death rate is about 33. Yellow fever does not seem to be severe, although reports do not agree on this point. The thermometer does not usually range higher here than 90° F., but sometimes it reaches as high as 95° F. in the shade.

The bay, which is 57 square miles in extent, is said to be the second one in size in Cuba. The entrance to this harbor forms a narrow gut from 4 to $4\frac{1}{2}$ miles long, and has two bays within its limits, one properly called

Nuevitas, and the other Mayanabo. Into each of these empty two rivers. In the harbor itself are islands known as Los Ballenatos (young whales). The bay of Nuevitas is somewhat circular and about $6\frac{1}{4}$ miles in diameter. Mayanabo, a projecting northwestern horn, is some 13 miles long and 8 miles wide, and is of the first class, though shallow. On the official charts a depth of 17 feet is marked when nearly 1 mile distant from the town, and 26 feet when more than 2 miles distant, so that foreign vessels must anchor far from the town and have abundance of sea room.

Recent reports state that there are now stone towers and earthworks in all the main streets of the town, and that the churches are fortified. There is a large stone convent strongly fortified on highest point of the town. There is a Martello tower at entrance to harbor; also an earthwork, said to have two guns.

SAILING DIRECTIONS.

PORT NUEVAS GRANDES.—From Manati the coast trends about NW. 2 miles to Braba Point, and then NW. by W. $4\frac{1}{4}$ miles to the entrance of Nuevas Grandes, which is merely a small tortuous inlet, in some parts only 200 yards wide and only navigable for vessels under 12 feet draft. All this part of the shore is foul, and the reef extends off about $\frac{1}{2}$ mile from the entrance of the inlet, through which a channel is formed leading to the port.

PORT NUEVITAS DEL PRÍNCIPE.—From Nuevas Grandes the coast takes a NW. direction for 13 miles to Nuevitas del Príncipe, is skirted by a reef all the way, and should not be approached within $2\frac{1}{4}$ miles.

The land is low on both sides of entrance; the town is surrounded by hills from east to SW.; back of the town the land is low. The entrance of the harbor may be recognized by the Maternillos lighthouse, by three small hills on the south side of the harbor, and by three islets in the harbor called Los Ballenatos, a little higher than the surrounding land. Also on the east side of the entrance is a quadrangular building, painted yellow, surmounted by a white mast, from which is shown a light.

The harbor is large, completely sheltered, and capable of admitting vessels of the largest draft. The entrance is through a crooked, narrow channel nearly 6 miles long. Middle Shoal is in the center of the channel, so that the assistance of a pilot is desirable, although there are no hidden dangers. The outer points of the entrance are low and about $\frac{1}{2}$ mile apart. In entering without a pilot the eye and chart are the best guides. Care must be taken to avoid a dry sand spit near the end of the eastern reef and bearing N. 56° E. (N. 54° E. mag.) 1 mile from the flagstaff on the point. The harbor in front of the town is shoaling and vessels drawing 14 feet should not come inside of Guincho Point.

If it is only desired to communicate with the town, anchorage will be found off the fort about $1\frac{1}{4}$ miles within the entrance. The town of San Fernando de Nuevitas is 14 miles from the entrance, on the point of a peninsula which separates the southern part of the harbor from Marinavo Bay; it does not come in sight until Guincho Point is passed.

At the entrance of the port the tidal stream is said to have a strength of 3 miles an hour. Tide rises about $2\frac{1}{2}$ feet.

Provisions are abundant. Rain water can be had from cisterns. River water not used. The bay is celebrated for its fish; they are abundant and in great variety.

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Authorities to visit: Captain of the port.

Steamers.—Steamers cross either way to and from Habana every five days. Herreras West Indian Line, two steamers a month to Puerto Rico and three to Santiago de Cuba and return.

Mails from the United States, via Tampa, to Habana twice a week in summer and three times in winter. They are quite regular. Six days to New York when connections are made.

Telegraph.—Telegrams can be sent to all points via Principe and Habana.

Pilots are spoken of as being intelligent and reliable. Two pilots reside in the houses near light at east entrance point and two pilots reside in town. Strangers should always take a pilot before going up to the town.

Light.—On Barlovento or Pilot Point, the east side of the entrance, is a quadrangular building painted yellow, and a white mast stands in the middle of it, from which is exhibited, 48 feet above the sea, a white light, visible 9 miles.

2. AYUNTAMIENTO OF PUERTO PRÍNCIPE (SANTA MARÍA DE).

Capital, Puerto Principe.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Aguacate	22	
2. Alta Gracia	16	
3. Banao	22½	
4. Caobillas	28	
5. Cascorro	38	
6. Cubitas Arriba	26	
7. Guanajo	34	
8. Guayabal		
9. Guimaro	50	
10. Limones	18	
11. Magarabomba	30	
12. Minas	24	For description, see below.
13. Mulato	18	
14. Pueblo Nuevo	3	
15. San Jerónimo	26	
16. Sibanicu	32	
17. Vertientes	40	
18. Yaba	4	
19. Yeguas	17½	

MINAS.—Half way between Nuevitas and Puerto Príncipe. Railroad roundhouses; point of departure of armored cars. It stands on level ground, but there is a ridge one-half mile south of the town, with earth-works about 300 feet long; some guns; and 10 or 12 blockhouses around

the town. The railroad station is prepared for defense, and has two guns sweeping the streets of the town. Water supply from wells.

ROUTES TO PUERTO PRÍNCIPE.

From Habana to Nuevitas by sea; then by rail.

PUERTO PRÍNCIPE is a city of 40,879 inhabitants, capital of the province of the same name, situated 464 miles from Habana. It was founded by Velasquez in 1515, on the harbor which Columbus called Puerto Príncipe, but which to-day is called Nuevitas. It was moved inland the following year to a place occupied by an Indian village called Camaguey. It is here we now find it. It has no especially notable buildings, and such a thing as a hotel is not known, although the city is one of the oldest on the island. It has various societies, boards of health, boards of education, and convents and charitable organizations. There is a veterinary school, a theater, public schools, and casinos. Post office and telegraph station.

This city was long the second city in size in Cuba. It is farther inland than any place of note in the island, being about 34 miles from the northern and 45 miles from the southern coast. A railroad connects it with its seaport, Nuevitas, 45 miles northeast. Forty-five miles south of it is the port of entry, Santa Cruz, but the communication therewith is over a difficult wagon road. Communications with Habana are made first by rail to the port Nuevitas and then by sea to the capital. The city is located on a broad sandy savanna at a considerable elevation above the sea, and is the quaintest, most antiquated town in Cuba. It is a relic of the Middle Ages, having narrow tortuous streets, which in many cases are unpaved and without sidewalks. It is situated in the heart of the grazing and cattle-raising country, from which industry it derives its importance. It has no mountains to cut off its sea breezes. A small river runs through the town. The country about the town is generally rolling. Yellow fever prevails sometimes, notwithstanding the town's elevated position.

The houses of the town are built of stone and brick, and the churches fortified. This is the headquarters of the Spanish troops in the province. There are fifty-four defensive works in and about the city. Among them are Fuerte Punta de Drainante, a somewhat extensive bastional fortification, with ditches and barracks; Torre del Ojo de Agua; Torreno de la Quinta; Torre de Juan de Torre; Torre de Garrido; Torre del Paso de Vigas; Torre del Paso de Quinones; Torre del Paso del Carnian; Fuerte y Campó de Puella, consisting of two square towers set at diagonal corners of a large square, which square is completed by stockades; Fuerte Guayabo, an irregularly shaped stone work, with bastions capable of holding a garrison of 100 men; Torre de Noguinas; and, adjacent to the railroad terminal, are the permanent infantry barracks, situated on the same block with the military hospital. There are also the cavalry barracks; Fuerte de Rodas, a sharp pointed single redan; Torre de la Beneficencia; Torre del Corro, consisting of two towers, perhaps 200 feet apart, connected by a stone curtain; Fuerte El Polverin, a somewhat extensive square fort, with bastional corners; Torre del Paso de Masvidal; Torre de Masvidal; Torre de Fercades; Torre del Trapichi; Torre de la Seiba; and Fuerte El Voluntario, a medium-sized stone work with numerous angles; Torre

del Cayo; Fuerto Serrans, a pointed redan with extended flanks, and Torre Maranouis. In the western portion of the city is another permanent barracks, and in the center of the city are the artillery barracks.

Around the town are earthworks, blockhouses, and wire entanglements. The best direction for attack is that in which the railroad enters the town, i. e., from the east. There are guns in position in earthworks. The town is heavily garrisoned and regarded by Spaniards as a very important place. It has plenty of wood and water, and forage in the vicinity.

3. AYUNTAMIENTO OF SANTA CRUZ DEL SUR.

Capital, Santa Cruz del Sur.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Buenaventura -----	41	Depending on, this village are Barcena, 100 inhabitants; Caridad, 86; Sagasta, 150.
2. Guayabal (El) -----	50	
3. Junco -----	34	
4. Larga (La), or Guai- canamar -----	23½	
5. Santa Cecilia -----	7	

SANTA CRUZ DEL SUR.—A seaport of 1,000 inhabitants, situated 75 miles from Puerto Príncipe. Santa Cruz and Puerto Príncipe are reported to be connected by a wagon road, necessitating "a tedious and uncertain journey by horse or volante." It is located directly on the seashore, a little west of the mouth of the river Santa Cruz. Post office and telegraph station.

Santa Cruz is now, and is reported to have been, a port of entry since 1838, but is of little consequence. It possesses no inclosed harbor, and the open sea, which fronts it, is so shallow that it has but a depth of 9 feet at half a mile, and of 24 feet at more than 2 miles distant from the shore.

The town is situated immediately in front of the sea, the waves sometimes reaching the houses when the tide is high. There is but one street. It extends from east to west, and is about 1½ miles in length. The ground behind the houses is swampy and impassable. Cedar, mahogany, honey, and wax are shipped to the United States to the annual value of \$300,000 to \$400,000. The climate may be called good, considering the bad situation of the town and the lack of sanitary measures there. For several years there has been no case of yellow fever, but with the arrival of the Spanish troops it developed, and, owing to the utter lack of hospitals and medical assistance, spread widely. As soon as the troops were removed, however, the disease disappeared, and the town has been healthy since that time, with the exception of a few cases of paludic fever.

SAILING DIRECTIONS.

The anchorage of Santa Cruz is accessible only to vessels of light draft. Vessels bound here should, from the western edge of the reef off Cape Cruz, steer a N. 15° W. (N. 18° W. mag.) course, which will lead up to a group of eleven small cays extending east and west, the two most westerly of which are the largest. The eastern cay is called Coiba, and is distinguished by some round-topped trees in its center. Immediately to windward of Coiba Cay is a remarkable sandy cay, and near it is another, where the pilots reside.

The United States is represented by a consular agent.

The least depth of water in the Cuatro Reales Channel is 16 feet. The channel leading to Santa Cruz is narrow and crooked, but the water is so clear and the shoals so steep-to that the vessel may be easily guided by the eye.

CUATRO REALES CHANNEL.—The Cuatro Reales Channel is entirely closed, the bar being awash.

The channel leading to Santa Cruz is to the westward of Coiba Cay, between that cay and the one to the westward of it. The course through the channel is N. 24° E. (N. 21° E. mag.), and a sand cay to the northward of Coiba Cay is left to the eastward. The pilots claim 11 fathoms of water in this channel.

PROVINCE OF SANTIAGO DE CUBA.

(418)

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SANTIAGO DE CUBA.

1115	VICTORIA DE LAS TUNAS.
92	YARA.
980	585 635 HABANA.

PROVINCE OF SANTIAGO DE CUBA.

LOCATION AND BOUNDARY.

Santiago de Cuba is situated in the eastern extremity of Cuba. It is bounded on the north by the Channel of Bahama; on the east by the Strait of Paso; on the south by the Caribbean Sea, and on the west by the Province of Puerto Príncipe.

AREA AND POPULATION.

The area comprises 16,573 square miles, being 220 miles long and 100 miles wide. The population consists of 203,185 souls, distributed among 6 cities, 4 towns, 4 villages, 200 hamlets and suburbs, and 17,000 rural estates.

ADMINISTRATION.

Santiago de Cuba is a second-class province with regional government and general military and naval command, administrations of finance and roads and communications, provincial deputations, 15 *alcaldes municipales* (mayors), 8 vicars, and 41 parishes.

The judicial districts are the six following: Manzanillo, Guantánamo, Bayamo, Holguín, Baracoa, and Santiago de Cuba; subdivisions of townships are Santiago de Cuba, Altosongo, Caney, Cobre, Guantánamo, Sagua de Tanamo, and Dos Caminos. Districts and municipalities have each their special courts of justice. This province forms part of the diocese "the Archbishopric of Santiago de Cuba."

PUBLIC INSTRUCTION.

There is in this province one college with 255 students; in the public schools there are 6,031 in attendance. The expense of education is sometimes defrayed by patriotic societies. Educational advantages in this part of the island are less than in the western division. The girls are mostly taught embroidery and etiquette. An edict was once issued by the Government forbidding the education of the children of Cuban parents in the United States, lest they should imbibe liberal ideas.

AGRICULTURE, INDUSTRY, AND COMMERCE.

AGRICULTURE.—The province is rich in vegetation, and in it are found all the productions of the island, viz, especially sugar, coffee, cocoa, honey, wax, cabinet woods; besides tobacco, cereals, iron ore, quarries of slate, marble, mercury, and a great variety of minerals, especially copper. There is, too, excellent pasturage, sustaining great numbers of cattle, etc.; hunting and fishing is good.

INDUSTRY.—The exploiting of mines, the manufacture of sugar, tobacco, cocoanut oil, chocolate, soap, ice, petroleum, and liquors; cattle raising and the exploitation of forests are among the multifarious industries.

COMMERCE.—Trade is carried on chiefly from the port of Santiago, the chief harbor of the island and the principal shipping port; it is, moreover, one of the best in the world. The commerce of the province consists in the export of cabinet woods and of all of its articles of manufacture, either to foreign ports or to other provinces or cities of Cuba, and the importation of merchandise, etc., from other countries.

GEOGRAPHY AND TOPOGRAPHY.

In Santiago de Cuba are located the highest mountains of the island. From Cape Maisi to Cape Cruz a mountain chain passes close to the seacoast, then turning abruptly west it passes along the middle of the island, breaking away now and then to the north or to the south. In this province a junction in the central and eastern parts creates an intricate system of verdure-clad elevations cut into sharp ridges known as "cuchillas," as distinguished from the sierras or peaks styled "saws." The first so-called range is the Sierra Maestra, and is the best defined mountain chain on the island. From Cape Cruz it rises in a succession of terraces, soon attaining an altitude of 5,140 feet; an increase of elevation follows till the Blue Peak of 8,320 feet is reached. Near the Blue (Turquino) Peak spurs are sent off north into the valley of the Cauto, giving an undulating character to the famous tropical valley of Bayamo. From Turquino the mountain continues under the name of Sierra de Cobre; here are the noted copper mines of the province. In the Cobre range, resting on a pyramidal peak 3,300 feet high, is the "Gran Piedra," a huge boulder 150 feet in length and 45 feet wide. In this vicinity the

Sierra Maestra on the south merges into the main range, and the maze of the cuchillas becomes the dominating orographical feature, while a great number of streams send their waters into far-separated seas.

The extremely broken and precipitous character of the country causes the province to be less known than any of the other political divisions. A notable truncated cone is seen near the port Baracoa, bearing the name El Yunque de Baracoa (the anvil of Baracoa). Numerous cascades, cataracts, and natural portals, surrounded by ever-verdant foliage, combined with numerous species of orchids and other flowering tropical plants in all their colors, and with animal life, present a rare picture. The mountains are interspersed with tracts of great fertility. Earthquakes occur chiefly in Santiago de Cuba. The caves of Monte Libano, Holguín, Bayama, and Gibara are among the most noted of subterranean wonders. Some lakes are quite insignificant; there are two islands off the eastern coast. Shoals, sand banks, reefs, cays and peninsulas, creeks and marshes, are all constituents of the topography and geography of Santiago de Cuba. The topography of the surface under the sea is said to be similar, especially near these coasts, the islands being but the peaks of lofty submarine mountains—the coral reefs, the disintegration and accumulation of numberless insects.

RIVERS.

The principal river of the province is the Cauto. It is 12 miles to the northward of Manzanillo and is one of the deepest rivers in Cuba, and navigable for a distance of 60 miles. The bar carries about 6 feet of water.

Others are:

The Moa River, one of the largest in Cuba, has a fall of more than 300 feet a short distance from the mouth. The entrance is shallow and only 30 yards wide, but the river deepens inside. About 12 miles inland are some mountains called the Sierras de Moa, which are good landmarks. From the mouth of the river to Yaguasey Point, $1\frac{1}{2}$ miles to the westward, the coast is low and formed by sandy beaches, alternating with mangrove swamps, through which the creeks or esteros of Fabrica and Yaguasey empty. From Yaguasey Point, which is low, the coast, also low and covered with mangroves, trends WSW. for $1\frac{1}{2}$ miles to the mouth of

the Estero de Moa, where there are three or four fishermen's huts, the remains of a former settlement.

The Bariguita River: Good water may be obtained at its mouth, which is sheltered by a reef of rocks extending 100 yards from the isolated hill. Near Larga Beach Point there is a lake of salt water, but its mouth is only open during the rainy season.

The Gibara River, navigable for a short distance by boats, empties into the head of the bay. Coast pilots for the north coast of Cuba and the Old Bahama Channel may be obtained here.

The United States is represented by a consular agent.

The Seco River is only open during the rainy season, and during the remainder of the year is closed by two bars, one of stone, and the other, farther in, of sand. The water is hardly fit to drink, and is difficult to obtain by boats on account of the bars. In case of necessity, the best place to water will be to the leeward of the mouth.

The Jauco River is $\frac{1}{2}$ mile from the Playa Blanca, emptying over a sandy beach, and navigable for boats during the rainy season. Near the mouth of the river is a rocky point, having a cavern in it called the Cueva de Jauco.

All along this part of the coast the mountain range is close to the shore. The three cuts or ravines of Caleta, Caletilla, and Jauco are very conspicuous. The land is thickly wooded, especially near the Jauco River.

A rocky ledge commences near Caleta Beach, and skirts the shore at an average distance of 300 yards as far west as Muertos Beach. A little outside of it, or about 400 yards from the shore, the depths are 9 or 10 fathoms; but off the point and cave of Jauco this depth is found at $\frac{1}{2}$ mile distance.

Smaller rivers are Yarigua, Tecaji Uipe, Mayari, Teneme or Tesino, Sagua de Tanamo, Yaguanegue, Cabana, Yamani-guey, Uibujan or Juragua, Toa, Yumuri, and Maisi in the north; Jojo, Labana la Mar, Yateras, Guantánamo, Bacanao, Aguadores, and Turguino in the south; Sevilla, Tana, Jibacoa, Yara, Jicotea, Buey Cauto, Biramo, and Jababo in the west.

THE COAST LINE.

The coast south of Cape Maysi is exposed to the eastward; the sea breaks upon it, and it should not be approached. At $\frac{1}{2}$ mile south of the cape is Pintado Point, southward of which

the shore is called the Coast of Pintado. At $1\frac{1}{2}$ miles from Pintado is Quemado Point, a little salient. Nearly a mile from the latter is Bufeo Point, and about 5 miles farther on is Negra Point, 300 yards north of which there is a spring of fresh water.

The coast for 200 yards westward of Puerta Point is of soboruco; thence it curves somewhat outward for a distance of $3\frac{1}{2}$ miles. The shore for about $\frac{1}{2}$ mile west of the point is called Guayacanes, and near its west end and a little inland is the valley of the same name, with a break in the mountain. At the distance of a mile farther on is Guayacanes Point, which is dark, of moderate height, and projects, with two small bays between. To the westward of the point is a beach named Managuaco, about $1\frac{1}{2}$ miles in extent, with some scattered rocks near its western extremity; then follow some cliffs of soboruco, and the small bay of Caoba, which is of sand and scattered rocks, and lastly for about $\frac{1}{2}$ mile a rocky shore, when commences the beach of Imia.

The Beach of Imia is about $\frac{3}{4}$ mile long, and near its eastern end is the mouth of the river of the same name. To obtain water from the Imia River, the shore will be approached most easily WNW. of the small bay of Caoba, where it is clear of reefs. The mountains rise abruptly from the shore and are covered with trees. A broken reef skirts the shore at a distance of 70 yards.

From Imia Beach the rocky coast of moderate height continues westward with an outward curve for 4 miles to Yacabo Point. In the middle of it is Imia Point, steep and of moderate elevation. Yacabo Point is a little salient, and from it the coast runs almost in a straight line to Piedras Gordas Point.

The coast from Guantánamo takes a westerly direction for about 20 miles to Berracos Point, which forms a remarkable round hill; it is clear of danger and may be approached to the distance of a mile. Thence it trends northwesterly 5 miles, forming the bight of Cape Baxa (Low), and then resumes its westerly direction to the Juragua River, the entrance to which is about 8 miles from Berracos Point. To leeward of the bight of Cape Baxa there are three shallow sandy bays, separated by high scarped hills, called Los Altares, or The Altars, from the eastern one having a remarkable flattened summit, which are backed by the lofty mountains of Maestra.

From the Juragua River the coast continues westward for 9 miles to the entrance of Santiago de Cuba; between are the mouths of the rivers Sardinero and Aguadores; in the vicinity of the latter several small houses are to be seen. All this part is bold and steep-to, and may be freely approached to the distance of a mile. At 7 or 8 miles eastward of Santiago de Cuba a vessel can anchor in 17 fathoms water, off a valley or break in the land, $1\frac{1}{2}$ miles from the shore. It has been reported that with the Morro Castle bearing between N. 45° W. (N. 47° W. mag.) and N. 5° E. (N. 3° E. mag.), distant 1 mile, there are 4 fathoms, rocky bottom, and there is the same depth within 400 yards of the shore.

The beach of Sabana is $\frac{1}{2}$ mile in length; at its east end is a lake, and at its west end a river of good water runs into the sea, with its mouth free of obstructions, where water can be had without difficulty. The beach of Ciguatos, $\frac{1}{2}$ mile in extent, follows that of Sabana, and is separated from it by a small rocky cliff of about 120 yards in length. At the west end of Ciguatos Beach the river of the same name empties in the rainy season, and in order to approach it, it is necessary to close the middle of the beach and pass within the rocky heads until arriving at its mouth. Thence a rocky coast runs westward for 800 yards to a point somewhat salient, called Jaba; then for more than $1\frac{1}{2}$ miles farther the coast is high and steep, and 800 yards from its west end is the bay of Jaba, the entrance of which is not more than 110 yards wide, with a shelly, rocky beach fronting it. At the back, on the hill, about 110 yards from the sea, there is a spring of good water.

From Jaba Bay the rocky coast runs a mile farther to the entrance of Port Baitiqueri, and $\frac{1}{2}$ mile to the SW. of it is the point of the same name. This part of the shore is called the coast of the Boquerón, from a break in the mountain, by which Santiago de Cuba may be known. The high mountains range all along to very near the coast, forming several breaks or openings.

The coast of Cuba from Cape Maysi trends N. by W. $\frac{1}{4}$ W. for nearly 2 miles to Kiembra Point, near which a portion of the coast of about 264 yards in extent is formed of soboruco, and here the light tower stands. About 700 yards northward of the tower is Mangle Point and entrance to the Maysi River, and 600 yards farther on is Estaca Point.

The coast, from Fraile Point, forms a slight indentation as far as Mangorita Point, which is somewhat salient; and on its eastern part is a small bay, where there are five rocks. The coast then continues straight to the Guanál Leap, which is high and abrupt; thence the shore is of low soboruco to a point a little salient, named Guanál, with a wood of palm trees on it. Then follows Frailecito, similar to Fraile Point but smaller, and lastly that of Silencio. From this point the first part of the coast is of soboruco, and then sand and gravel as far as the mouth of the Yumuri River.

The coast from Baracoa trends about NW. $\frac{1}{2}$ N. 9 miles to Bay or Vaez Point, forming first a headland of soboruco, somewhat salient for about a mile, and the points of Camello, Cerro, and Duaba, the latter terminating in a long point, and 300 yards from it the river of the same name runs into the sea. Then follows Duaba Beach, 1,200 yards in length, forming a bay near the mouth of the river, which is generally about 16 yards wide, increasing to 90 yards in the rainy season; it runs parallel to the shore to the end of the beach, and then turns suddenly to the SSE.; the point here is named Jibaracon, where the river forms an opening during heavy rains.

Next to Duaba Point the Toar Beach runs in a straight line more than a mile to the mouth of the river of the same name, which is about 10 yards wide, but increasing during rains; it forms a lagoon with several islets. Then Canes Beach, a mile long, ends at Canes Point, which is the beginning of the rocky coast of the same name. From this point, round, somewhat salient, and known by a large palm tree and a house over it, the coast of Canes and Sigua for more than a mile is of soboruco, which terminates at Sigua, a small bay about 400 yards in extent, only used by very small vessels in fine weather. From Sigua the rocky coast trends westward for $\frac{1}{2}$ mile, forming Maravi Point, as far as the entrance to the port of that name.

Between Baracoa and Bay Point the coast is backed by high land covered with vegetation to very near the shore. Between Baracoa and Duaba Point the hill of Jaitecico rises about 600 yards, is about $\frac{1}{2}$ mile in extent, of little elevation, covered with trees, and is useful as a mark. There are 92 fathoms water about $\frac{1}{2}$ mile from the coast, and 13 to 23 fathoms, sand

and rock, 400 yards from it, except off Duaba and Toar beaches, where there are 92 fathoms $\frac{3}{4}$ mile off shore, and 14 to 46 fathoms at $\frac{1}{2}$ mile.

Water may be easily obtained from the Duaba River; small vessels can anchor near it, in the bight of the rocky coast formed by Duaba Point.

The coast from Jaragua trends first about WNW. and then north, forming a bay, as far as Mangle Point, which is 7 miles from the former. The reef, which begins at Jaragua, skirts the whole of this bay, extending 2 miles off shore.

The coast from the western point of Gibara Bay takes a northerly direction for 2 miles to Brava Point, and is bold and rocky. It then bends round about NW. for 7 miles to Gorda Point, and $5\frac{1}{2}$ miles farther is Mangle Point. The shore is rocky, sloping, and clean to Mangle Point, but it then becomes sandy and steep to as far as the eastern point of Herradura Bay, 7 miles to the WNW., where coasters drawing 10 feet find anchorage, but it is open to the northward. Thence it takes a more westerly direction for 7 miles to Port Padre. This latter part is low and foul to some distance; on the shore are many remarkable palm trees.

CAPES AND POINTS.

The principal capes and points along the northern coast of this province are as follows:

Cape Maysi is the eastern extremity of the island of Cuba. When seen from the southward the cape has the appearance of a long, low point. This part of the coast is low and covered with brushwood.

One or two miles west of Cape Maysi the land begins to rise, and, seen from the northward, forms three steps, the upper one 1,850 feet high, gradually sloping upward to the eastern summit of the Cobre Mountains. Strangers coming from the northward have mistaken the lower termination of the slope for Cape Maysi, and keeping away too soon have fallen to leeward.

In approaching the eastern end of Cuba from the NE., some of the peaks of the Cobre Mountains form good landmarks. The most remarkable is called El Yunque de Baracoa, or the Anvil, from its shape. It is 27 miles from Capè Maysi and 4 miles from Port Baracoa, for which it is a good guide. In

rounding Cape Maysi, it should be remembered that the current frequently sets to the westward with considerable strength, especially during the winter months.

Light.—On Cape Maysi, from a circular lighthouse, a fixed white light is shown at an elevation of 128 feet, and should be visible 17 miles.

PINTADO POINT.—About $\frac{1}{2}$ mile southward of Cape Maysi is Pintado Point; thence the coast, composed of soboruco, covered more or less with trees and brushwood, runs southward and SW. for $6\frac{1}{2}$ miles to Negra Point, forming first a projecting cliff and then a bay. Rather more than $\frac{3}{4}$ mile from the point is the Cueva de Pintado, a large cave, within which the sea breaks. About 1 mile southward of the cave is Quemado Point, slightly salient.

AZULES POINT.—From Estaca Point the shore, forming a slight bay, trends in a NW. $\frac{1}{2}$ N. direction for a mile to Azules Point; then follows the opening of Azules, where the beach ends, and another portion of soboruco extends for about $\frac{1}{2}$ mile to a small beach 100 yards in extent, and then continues for $\frac{3}{4}$ mile as far as the beach, which terminates in the northern extreme of the headland of Maysi.

PUERTOS AND RASITA POINTS.—From Azules Point the coast, after forming three small sandy bays, continues low and of soboruco to a point rather salient, named Puertos, on account of several openings formed by the land in its vicinity, and thence to another point more salient called Rasita.

BAGÁ POINT.—From Azules Point the coast begins to rise, and runs about WNW. for 5 miles to Fraile Point. Between Rasita and Bagá Points the shore is of soboruco and forms a bay. Bagá Point is a little salient, and known by three large rocks above it. About 400 yards within these rocks there is a well of good water, but it is difficult to approach the coast on account of the heavy sea which breaks on it.

FRAILE POINT.—Rasa Point is next west of Bagá Point, and the shore between forms an indentation as far as two large rocks. Thence the coast of steep soboruco continues as far as a large rock called Fria Cave; from here it is of low soboruco, with an inner range of the same kind of cliffs at a little distance from the shore, and continues to Fraile Point. Fraile Point is salient, high, with a rock at its foot resembling a friar's hood hanging down. About 200 yards westward of it there is a spring issuing from the rock. The coast

as far as Fraile Point is clear of danger, and thence about 8 miles westward to Port Mata it can be approached to the distance of a mile.

Besides, on the north are the following:

MAJANA POINT.—From Boma the coast of soboruco, forming some slight indentations, trends to the NW. $2\frac{1}{2}$ miles to Majana Point, which has two large detached rocks on it. About 200 yards westward of Boma there is a white spot which is seen at some distance and useful in recognizing the port; about $\frac{3}{4}$ mile farther on there is also a small opening in the soboruco with very white sand in its interior, named Caninguin; and about halfway between this and Majana Point lie some large detached rocks called Herrera.

MAPURISI POINT.—From Port Cayaguaneque the coast is of rock for $\frac{3}{4}$ mile to Mapurisi Point, which has two small sandy bays on its eastern side; thence for the space of a mile, as far as Nibujon Point, are five small sandy bays and a small opening called Seguro. To the westward of Nibujon Point is the beach of the same name, 400 yards in length, and above it several houses and cottages, and at its western end the river runs into the sea, the water of which is good for drinking. Then follows the rocky coast called Taco for about $\frac{3}{10}$ mile, and then the beach of the same name for 900 yards, which is of rock covered with white sand, and which terminates at the entrance to Port Taco. At the west end of the beach, near the east point of entrance, are some houses.

JARAGUA POINT.—The coast for 400 yards westward of Taco is of rock; then the beach of Jaragua for a long $\frac{1}{2}$ mile follows, when the coast is of soboruco and forms Jaragua Point, extending 400 yards from the reach. From the west point of entrance to Taco a reef skirts the coast, which terminates at this point, and is about 150 yards wide.

LUCRECIA POINT.—From Canones Point the shore runs in a NNE. direction 6 miles to Mulas Point, and is foul nearly a mile off. Thence it trends NNW. 4 miles to Manglito Point, and then about NW. for 2 miles to the east point of Larga Beach, on which stands Lucrecia lighthouse. The point of this latter name is about $\frac{1}{2}$ mile westward, and the land here rises by degrees from the sea to a height of about 200 feet a mile inland. From abreast Manglito Point a reef skirts the shore for $1\frac{1}{2}$ miles westward at a distance of 200 yards. From the lighthouse the shore trends nearly west for $1\frac{1}{2}$ miles to

Gorda Point, forming various points a little salient; this part of the coast is called Larga Beach, and it is bordered by a reef which extends northward $\frac{1}{4}$ mile. Between Manglito and Gordâ Points the shore is low and mostly of soboruco, with some parts covered with sand. A short distance from the sea mangroves and trees are seen, and the coast appears somewhat higher than it really is.

Light.—The tower near Lucrecia Point exhibits, at 132 feet above the sea, a flashing red light about every 55 seconds; duration of flash, 2 seconds. The light should be visible 18 miles.

The principal capes and points on the southern coast of Santiago de Cuba Province are:

NEGRA POINT.—A dark, barren, steep, projecting point, and easily distinguished; 1,200 yards off it there are 28 fathoms water, and at the distance of a mile the depth is more than 90 fathoms. From Negra Point the coast of soboruco, covered more or less with trees, forming a curve outward, trends to the south and westward for 7 miles to Caleta Point; it is backed by the high land, which is close to it. About 60 yards SW. of Negra Point there is a little bay and a cave, formed by vertical cliffs, where the sea breaks heavily, and is called the Cliff of Point Negra. About $2\frac{1}{4}$ miles SW. of Negra Point is Guanós Point, known by a wood of palm trees on it. Between the two points there are 28 fathoms water, rock and gravel, 1,000 to 1,200 yards from the shore; and between the latter and Caleta Point there are 18 fathoms, over gravel and rock, at 600 to 1,200 yards. Between Negra and Caleta Points the depth exceeds 90 fathoms $1\frac{1}{4}$ miles from the land.

CALETA POINT.—From Caleta Point the soboruco cliffs extend nearly a mile to the beach, called the Playa de Caleta, about 90 yards wide. A river flowing through a cut in the highlands empties about the middle of the beach. Its mouth is generally choked up, except during the rainy season, and the water near the beach is salt. A little higher up, however, it will be found to be fresh and good.

From this beach the soboruco cliffs continue $\frac{1}{4}$ mile to a white sandy beach called Playa Blanca. In the middle of this beach is a rocky point, just eastward of which and near the shore is a spring of excellent water.

LLANA POINT.—The beach of Llana extends over a space of $2\frac{1}{2}$ miles. In the middle of this shore there is a bed of a river called Cana, which is generally dry except in the rainy season; and 600 yards from the west extreme of the beach there is another glen, named Llana, which is also generally dry. Llana Point, composed of soboruco, projects a little at the western termination of the beach. The coast for $1\frac{1}{2}$ miles westward of the point is of cliffs, with one or two bays. In the first third of this space is the Leap of Jojo Point, which is high, salient, white, and seen at a great distance; the other two-thirds is high and steep. Jojo Point, $2\frac{1}{2}$ miles from Llana Point, is of black rugged rock, of moderate height, and at its inner part is an isolated elevation like a sugar loaf.

Tintorero Point is low and sandy; a mile to the westward of it is the mouth of the Tacre River, and $\frac{1}{2}$ mile farther on is Puerta Point, flat and sandy.

All along this part of the coast the high land rises abruptly from the shore, with breaks or ravines abreast of the Río Seco, Río Tacre, and Puerta Point. The mountains are covered with trees, with the exception of the Leap of Jojo, which is arid and barren.

The coast is bordered by a reef, broken in places, at an average distance of 200 yards from the shore. Everywhere along this part of the coast at $\frac{1}{2}$ mile from the land there are more than 90 fathoms of water.

Piedras Gordas Point is so called on account of the large boulders upon it. To the westward of this point the shore forms a bay, at the head of which is a beach 600 yards long. The shore is clear, except a rock near the eastern end of the beach, near which is a spring of fresh water, easier of access and more sheltered than the stream farther to the westward.

Guarda-rama Point is the western limit of this bay, and the next indentation in the coast to the westward is a small cove called the Guarda-rama de Yacabo, which is skirted by a flat reef and is almost unapproachable. The high land is here also very near the coast, with a break, through which runs the Yacabo River, emptying into the bay of the same name.

Fresh provisions may be obtained from the neighboring houses.

To the westward of the Guarda-rama de Yacabo the coast is rocky for about $\frac{1}{2}$ mile, followed by a beach $\frac{1}{2}$ mile long, with the mouth of the Ocampo River at its western end.

Sabana-la-mar Point is about 4 miles farther to the westward. It is a remarkable projection, steep, and moderately high, with a rock on its summit, and is about 27 miles west of Caleta Point.

MAL AÑO POINT.—From Baitiqueri the rocky coast runs SSW. for 3 miles to Tortuguilla Point; thence nearly west for 2 miles to the Yatera River, which empties itself into a sandy bay; from here it again trends SW. for 3 miles to Mal Año Point, which is easily recognized from the east or west. About 4 miles westward of the point is Port Escondido, to the eastward of which and near the entrance are two isolated hills. All this part of the coast is free from danger and can be approached to a mile.

REEFS, BANKS, AND CAYS.

The following are the principal reefs, banks, shoals, and keys [cays] of Santiago de Cuba, on the north:

MAYSI REEF.—The headland of Maysi is comprised between Pintado and Azules Points, a space of about 5 miles. It is skirted by a reef at the distance of 300 to 400 yards, which terminates at the latter point; it is awash, the sea constantly breaks over it, and there are several openings through it for boats and very small vessels. The openings most used are those of Hembra, Mangle Bay, or Estaca, leading to the Maysi River, and Azules; the others are not navigable with a fresh breeze.

MAYSI BANK.—A rocky bank borders the Maysi Reef, all along, with about 9 fathoms water on it at the distance of 500 to 700 yards, and a mile from it there are from 73 to 90 fathoms, sand, gravel, and rock. Cape Maysi is 200 yards eastward of the meridian of the lighthouse, and where the reef is most dangerous during the night.

Caution.—Vessels from the northward, bound to the southern coast, should be careful to steer sufficiently eastward to clear the reef; and in rounding the cape from the southward the light should be brought well westward before steering northward.

Currents.—Near the land off Cape Maysi the flood runs westward and the ebb eastward. During the summer months, with southerly winds easterly currents will be experienced, and with northerly winds southerly currents.

YUMURI REEF.—The Yumuri River runs through a great break in the mountains and empties 800 yards westward of Silencio Point. From this point a reef extends off 100 yards and skirts the shore as far as the mouth of the river, where it joins a gravel bank, which in places is 270 yards from the shore, and terminates at the Redonda Rock, which has a shore of gravel and sand between it and the river.

In consequence of the reef and bank, and narrowness and little depth of the mouth of the river, it is difficult to enter with small vessels unless in the rainy season. The water is drinkable $\frac{1}{2}$ mile from the mouth.

LARGA BEACH REEF.—From Larga Beach Point a reef skirts the coast as far as Mata Point, and in front of Manglito Beach it is about 300 yards off. There is a small opening through it in front of the middle of the Beach of Barigua, with $3\frac{1}{2}$ fathoms water, black sand, and $1\frac{1}{2}$ fathoms somewhat more within; and another opening in front of Manglito Beach only a few yards wide and $4\frac{1}{2}$ fathoms deep, coarse sand. From Silencio Point to Mata Point there is no bottom at 90 fathoms, a mile from the land. From the break at the Yumuri River the high mountain, covered with trees, ranges near the coast to the head of Port Mata.

Cayos de Moa are two islets lying just inside the reef, one mile westward of the opening. The larger one of the two is $1\frac{1}{2}$ miles long, from $\frac{1}{4}$ to $\frac{1}{2}$ mile wide, of rectangular shape, and has a projecting point at its SE. angle. The smaller cay lies NW. of the larger, from which it is separated by a narrow creek, is $\frac{1}{4}$ mile in diameter, and both cays are low and covered with mangroves.

The principal reefs, banks, and keys [cays] on the southern coast of Santiago de Cuba are as follows:

Pintado Bank is between points Pintado and Quemado. Near the shore there are from 4 to 8 fathoms of water, bottom of fine white sand. The edge of the bank is steep-to, there being from 18 to 28 fathoms 200 yards from the edge, and $\frac{1}{2}$ mile farther off no bottom at 90 fathoms.

Sombrero Rock, above water, lies about 60 yards off the eastern side of the beach.

There are a few small houses and some cultivated ground in the neighborhood; a small amount of fresh provisions and water may be obtained.

Cape Cruz Reef, on which the sea breaks heavily, commences $1\frac{1}{2}$ miles east of the cape, and extending to the westward terminates 1 mile SW. of it. There are often a number of fishing stakes on the reef, and its western extremity is frequently marked by a staff with a bunch of palm leaves upon it, placed there by the pilots. To the westward of the reef a bank with patches of $2\frac{1}{2}$ and 3 fathoms of water on it extends 3 miles farther west and NW.

In coming from the eastward do not bring Ingles Point, 8 miles east of Cape Cruz, to the eastward of N. 79° E. (N. 76° E.) till Coloradas Point, the second point north of the cape, and of dark green color, comes open of Cacimba Point, to avoid the reef.

Pilots.—There are from six to seven Government pilots, and care is taken that several of them remain at Cape Cruz so as to cause no delay. Pilotage is compulsory.

Caution.—Navigators must bear in mind that even the best charts give but an incorrect idea of the chain of cays, reefs, and shoals which extend 150 miles to the NW. from Cape Cruz. No good survey of this part of the coast has ever been made, and no materials exist for describing it correctly. A vast number of the cays are precisely alike, and the channels, when marked at all, are only marked by small bushes placed by the pilots, and which the first rough weather will wash away. There are doubtless deep navigable channels between the shoals, but they are only known to the pilots, who are very reticent and unwilling to communicate any information regarding them.

Perla Cay is a short distance S. 45° W. (S. 42° W. mag.) of these cays, and is a small islet which forms with the Gua Cays a channel about 200 yards wide, with 7 fathoms of water, muddy bottom.

The great chain of shoals, cays, and reefs which skirt this part of the coast commences about 15 miles NE. of Cape Cruz, with the great bank of Buena Esperanza, and extends to the westward as far as Maria Aguilar Point, near Trinidad.

The usual approach to Manzanillo is by the Balandras Channel, a narrow passage carrying 18 feet of water between the small cays off the SE. part of the Buena Esperanza Bank and the cays close to the Cuban shore.

Proceeding to the NE. from the Balandras Channel, in 7 to 8 fathoms of water, the Manzanillo and Gua Cays will be seen, and the passage between them should be steered for.

Vessels of 27 feet can go up to Manzanillo, but the channels are narrow, intricate, and badly marked, and none of them should ever be attempted without the aid of a pilot. No tonnage or light dues are collected.

Gua Cays, N. 22° W. (N. 25° W. mag.) of Gua Point, are three cays of the same name, and between them and Gua Point there is a channel over a mud flat, with a depth of 11 feet.

The Manzanillo Cays are a group of low islets, most of them covered with mangrove trees, affording a sheltered anchorage for large vessels, with deep water. In the middle of them there is a passage about 85 yards wide, with a depth of 7 to 11 fathoms.

There are three good careening places for large vessels, with deep water, and well sheltered, in the middle of these islets.

The bank of soundings lying between Cape Cruz and the eastern end of the Doce Leguas Cays, 55 miles to the NW., is clear of danger, and vessels may stand in to 7 fathoms anywhere, except from about 8 miles N. 20° W. (N. 23° W. mag.) of the cape to the cay on the southern extremity of the bank of Buena Esperanza; within these limits it is not safe for vessels to go within the depth of 10 fathoms, as the ground is intersected with numerous rocky ridges, some of them nearly awash.

BUENA ESPERANZA BANK.—From Balandras Channel the white sand bank of Buena Esperanza takes a westerly direction for 10 miles to a small cay lying N. 8° W. (N. 11° W. mag.) 17 miles from Cape Cruz. Thence it trends in a northerly direction for 18 miles, and then bends to the WNW. 13 miles to Cuatro Reales Channel, which is the eastern passage to Santa Cruz, having formed in this last distance the two passages called Barcos and Pitajaya. The entrance of Cuatro Reales Channel bears N. 23° W. (N. 26° W. mag.) 42 miles from Cape Cruz, and about 14 miles from the mainland to the northward.

GULFS, BAYS, AND ANCHORAGES.

The following are the principal gulfs, bays, and anchorages of Santiago de Cuba on the north:

MIEL BAY AND ANCHORAGE.—From Majana Point the coast trends westward for a mile to Rama Point, and then southward, forming a rounded headland, and the points of Guanál, Hondito, and Playuela; from the latter it runs

straight to the south of the mouth of the Miel River; here the rocky coast ceases, and the Miel Beach follows, extending west for a mile to the foot of Fort Matachin, of the town of Baracoa.

Between Rama and Barlovento Points is Miel Bay, about $\frac{3}{4}$ mile in breadth, and somewhat sheltered from easterly winds. When $\frac{1}{2}$ mile westward of Rama Point, steer to the southward until the mouth of the Miel River bears about S. 60° E. (S. 62° E. mag.), and then anchor in 5 or $5\frac{1}{2}$ fathoms water, black sand, 400 yards from the weather shore, which is of rock, and about the same distance from the beach; this is the most convenient berth. This anchorage is open to northerly winds. It is frequented for the purpose of communicating with Baracoa, if not wishing to go there. The river runs for a long distance parallel to the beach and very near it; water may be obtained a short distance from its mouth at low tide.

Supplies.—Water may be had from the river, but it is very shallow in the vicinity of its mouth and dry at low tide. Wood and small supplies of provisions may be obtained.

Yumuri Anchorage is in the bay between Silencio and Larga Beach Points, where vessels may anchor in 11 fathoms of water, sand and mud, 700 yards N. 43° W. (N. 45° W. mag.) of Redonda Rock, distant 500 yards from the reef. There is no shelter from northerly winds. Besides the reef and bank of Yumuri there are other dangers at this anchorage. The Gorda Rock patch is about 28 yards in extent, and about 200 yards to the NW. of Gorda Rock. The Bariguita Reef extends off 300 yards from the middle of the shore, immediately westward of Gorda Rock, with various rocks awash, one of which is named Buren. Lastly, Bariguita Shoals form a group $\frac{1}{2}$ mile in extent east and west, and 200 yards north and south in front of the Beach of Bariguita, from which it is distant from 200 to 400 yards. The eastern extreme of this group is 300 yards from Bariguita Reef; several of the heads composing it are visible, and between them are $4\frac{1}{2}$ and 5 fathoms water, over sand.

Jaragua is a small anchorage where small vessels may lie under shelter of the reef. The break or opening is about 200 feet wide and its edges on both sides are marked by breakers. Just inside the reef, abreast of the opening, are three small islets.

To enter the anchorage, coast along outside of the reef till the eastern point of the southern and largest of these three islets bears S. 67° E. (S. 69° E. mag.). Then steer for this point and anchor according to the vessel's draft of water.

Abreast of the middle islet there are $5\frac{1}{2}$ fathoms of water, decreasing farther in.

This vicinity should be avoided, and when near it the latitude should be frequently and carefully ascertained, especially at night, as a strong indraught is said to have caused many disasters.

The principal bays, gulfs, and anchorages on the south are the following:

Jojo Bay lies between Jojo Point on the east and Tintorero Point on the west. These two points are $\frac{3}{4}$ mile apart, and between them is an anchorage for small vessels.

Guanito Bay and Port Niguero are two shallow ports north of Limones River; they are suitable only for vessels of light draft.

CAZONES BAY.—The shore from abreast the west end of Blanco Cay recedes, forming a large bight in a NW. by W. direction, 7 miles deep, named Cazones Bay, which is shallow. The western side is formed by low mangrove cays terminating in Diego Perez Cay, 6 miles west of Blanco Cay. On the northern end of Diego Perez Cay there are some natural wells of good water. Fish and game are abundant.

Gulf of Cazones, between the NE. edge of the Jardinillos Bank on the south, and Piedras and other cays and reefs on the north, is dangerous for sailing vessels to cross, as they will be liable to calms and cross currents.

Caution.—The anchorage of Sombrero Rock should not be approached with southerly or SE. winds.

Good anchorage will be found to the northward of the reef Cape Cruz in 4 fathoms of water, with sandy bottom, with Cape Cruz bearing S. 50° E. (S. 53° E. mag.), Mount Ojo del Toro N. 79° E. (N. 76° E. mag.), and the extremity of the reef S. 11° E. (S. 14° E. mag.).

The coast from Santiago de Cuba takes a westerly direction for about 108 miles to Cape Cruz. The shore is bold, lofty, thickly wooded, and forms several bays and anchorages fit for small coasting vessels. The peak of Turquino, 8,400 feet high, rises a short distance inland about 50 miles westward of Santiago; and 37 miles farther on, and 15 miles eastward of

Cape Cruz, there is another remarkable mountain, called the Ojo del Toro, 5,190 feet high, which, when seen from the WSW., forms two or three hummocks. Thence the range decreases in height, and falls by steps to the cape, which is low and woody; near the extremity of the sandy point there are some huts and a flagstaff.

At 4 miles eastward of the cape the shore is composed of remarkable cliffs about 84 feet high, having horizontal strata resembling fortifications; near the cape they are copper colored, and the strata become perpendicular.

Light.—A light, showing a red flash every 75 to 85 seconds, 113 feet above the sea, is exhibited from a lighthouse on Cape Cruz, and should be seen 17 miles. The tower is stone and the keeper's dwelling yellow.

Anchorage.—Soundings appear to extend to a short distance all along this part of the coast, and in moderate weather a vessel may anchor in 6 or 7 fathoms of water off the sandy beach at the foot of Turquino. To the westward of Portillo the depths are 12 to 6 fathoms at from 2 to 4 miles off shore. The soundings are irregular, varying suddenly from 6 to $3\frac{1}{2}$ fathoms; but the bottom is easily seen, and there is no difficulty in picking out a sandy spot.

In the Bay of Yacabo there is an anchorage entirely open to the southward. Vessels anchoring here should do so at the eastern edge of the beach to avoid the rocky heads off the western end.

Small vessels may anchor on the bank in Jojo Bay, sheltered from E. by N., round by north to W. by S., but it is not a place to be recommended, as the sea rolls in heavily. In standing in for it keep closer to Jojo Point than to the other side, to avoid a sunken rock, and anchor just inside of the line joining the two points in 9 or 10 fathoms of water, sandy bottom, about 300 yards off shore. Vessels anchoring farther out, in 13 or 14 fathoms, will be much more exposed to wind and sea.

Anchorage.—The anchorage of Caleta is on a bank of fine white sand, with a few spots of rock and gravel in the indentation between Caleta Point and the western extremity of the Playa Blanca. It is sheltered by high land from ESE. round by north to west. Although heavy squalls sometimes cause ships to drag here, this anchorage is very useful, as it is the only one in the vicinity.

In approaching this anchorage a vessel should steer in for the beach till within $\frac{1}{4}$ of a mile of the shore, and let go the anchor in 10 fathoms of water.

This locality may be known by two small hills on the slope of the high mountain toward Caleta Point. With the wind from south or SE. a vessel should not anchor here. A rocky head, with less than 3 fathoms on it and 5 fathoms around it, lies on the line between the beach and the point of Caleta, at a distance of nearly 400 yards from the former.

Water can be obtained at low tide from a spring at Playa Blanca. Wood also can be obtained.

The opening into Mangle Bay is almost always practicable, being about 130 yards in breadth, and 7 fathoms deep, but a rocky head with a little more than a fathom water on it lies on its south side.

This is the only regular anchorage within the reef used by small vessels, where there are 7 and 8 feet water, sand and weed, but seek for a clear place between the rocks.

South of Mangle Point are Yaminigüey and Cañete Anchorages, which are entered through two breaks in the reef, for which the best guide will be the plan, but they are fit only for small craft. At night or in hazy weather it is necessary to be cautious in passing this reef. From Mangle Point the coast runs WNW. for 7 miles to the Moa River, and is skirted by a reef at the distance of $1\frac{1}{2}$ to 2 miles.

RAILROADS.

This province has only about 85 miles of trackage within her borders, divided among four local roads, as follows:

1. From Santiago de Cuba north to San Luís, 20 miles, and from Junction— $1\frac{1}{2}$ miles north from Cristo, east via Alto Songo—to Minas de Ponupo, 11.5 miles, single track and standard gauge, belonging to the "Sabanilla y Moroto R. R."

2. From Holguín to Jibara, $25\frac{1}{2}$ miles, single track, standard gauge, belonging to the Ferrocarril de Holguín. A local line.

3. From Jamaica to La Caimanera, 19 miles, single track, standard gauge, belonging to Ferrocarril de Guantánamo. A short, local line.

4. From Cobre to Cayo Smith, 8 miles. This line is now abandoned.

5. From Santiago de Cuba south, via Virmeza, to America, 19 miles, single track, narrow gauge, belonging to the Juragua Iron Company.

6. From Daiquiri north to beyond Vinent, 3 miles, single track, narrow gauge, belonging to the Spanish-American Iron Company.

7. From Sigua north to Arroyo la Plata, 5 miles, single track, narrow gauge, belonging to the Sigua Iron Company.

1. SANTIAGO DE CUBA RAILWAY.

TABLE OF DISTANCES.

San Luis Branch.

SANTIAGO DE CUBA.

4	CUABITAS.		
6	2	BONIATO.	
7	3	1	SAN VICENTE.
8	4	2	1 DOS BOCAS.
10	6	4	3 2 CRISTO.
12	8	6	5 4 2 MORÓN.
17	13	11	10 9 7 5 DOS CAMINOS,
20	16	14	13 12 10 8 3 SAN LUÍS.

Minas Branch.

SANTIAGO DE CUBA.

10	CRISTO.		
11.5	1.5	JUNCTION.	
16	6	4.5	ALTO SONGO.
19	9	7.5	3 SOROCCO.
21	11	9.5	5 2 LA MAYA,
23	13	11.5	7 4 2 MINAS DE PONUPO.

ITINERARY OF SAN LUÍS BRANCH.

Leaving Santiago de Cuba in a northeasterly direction, the Sabanilla y Maroto Railroad crosses the Cobre road and a wooden bridge 0.6 mile from Santiago de Cuba, and the St. Antonio and the Real de Guantánamo roads, and at Junction, 2½ miles from Santiago, a branch railroad was built in an easterly direction to El Caney, 1½ miles from Junction. This branch has been abandoned.

From Junction the railroad runs in a northerly direction to Cuabitas, 4 miles from Santiago de Cuba, crossing twice the Guantánamo road, and a wooden bridge called the "Puente Papagatorio."

Thence it runs to Boniato, 6 miles from Santiago de Cuba, leaving the Santiago water works, 5 miles from Santiago de Cuba, to the east, and again crossing the Real de Guantánamo road.

Distances from
Santiago de
Cuba.

7 miles.	From Boniato the railroad runs in an easterly direction to Cristo, crossing again the Guantánamo road, and a wooden bridge near Boniato, and passing the station San Vicente, 7 miles from Santiago, and the station Dos Bocas, 8 miles from Santiago, and also crossing the Cristo road near Dos Bocas, and another road near Cristo. Cristo is 10 miles from Santiago de Cuba.
8 miles.	
10 miles.	
11 miles.	From Cristo the railroad runs in a northwesterly direction to Dos Caminos, crossing a road near Cristo, a road running through the village of Cristo, and an iron bridge called "Puente Manacos," 11 miles from Santiago. At a distance of 11½ miles from Santiago de Cuba a branch railroad runs in a northeasterly direction to Minas de Ponupo, the terminus.
11½ miles.	
12 miles.	From Junction to Dos Caminos the railroad passes the station Morón, 12 miles from Santiago, crossing two roads near this station, and a wooden bridge called "Puente Arroyo Blanco" over the Arroyo Blanco Creek, 15 miles from Santiago, and a road near Dos Caminos. From Cristo to Dos Caminos is 17 miles.
15 miles.	
17 miles.	
18 miles.	From Dos Caminos the railroad runs in a westerly direction to its terminus, San Luís. On this run it crosses the Guanicon and Real roads near Dos Caminos, and a bridge called "Puente San Rafael," 18 miles from Santiago, and another bridge over the Arroyo Naranjo, 19 miles from Santiago, and also a road near San Luís. The railroad station at San Luís is called "Estación de las Enramadas."
19 miles.	
19.2 miles.	At a distance of 19.2 miles from Santiago, and near San Luís, a spur of about ¼ mile in length branches off to Ingenio Unión.
20 miles.	The distance from Dos Caminos to San Luís is 20 miles.

ITINERARY OF MINAS BRANCH.

11½ miles.	The first station on the branch of the Sabanilla and Maroto railroad, running in a northeasterly direction from the Junction, 11½ miles from Santiago, to its terminus, Minas de Ponupo, is Alto Songo. On this run the railroad crosses an iron bridge called "Puente Guaninican," near the Junction; three wooden bridges, "Puente Martín López," "Puente Algodonal," and "Puente Juanora," the last one being 14 miles from Santiago, and the first two being equal distances from the last one and the Junction. Then the railroad crosses an iron bridge, "Puente Platanizo," 14.6 miles, and a wooden bridge, 15½ miles from Santiago, and the Alto Songo road.
14 miles.	From Alto Songo the railroad follows the Guantánamo road to its terminus, Minas de Ponupo. Leaving Alto Songo, the railroad crosses a wooden bridge, 17 miles from Santiago, and the Sagua and La Paz roads, until it reaches Socorro, 19 miles from Santiago.
14.6 miles.	
15½ miles.	
17 miles.	From Socorro the railroad crosses the Mijial road and runs to La Maya. The Mijial road is half way between La Maya and Socorro.
19 miles.	
21 miles.	

From La Maya the railroad runs to Minas de Ponupo, forming a loop at this station.

Distances from
Santiago de
Cuba.
23 miles.

2. HOLGUÍN-GIBARA RAILWAY.

TABLE OF DISTANCES.

HOLGUÍN.

3		AGUA CLARA.		
11	8	AURAS.		
13	10	2	CANDELARIA.	
16	13	5	3	ARROYO BLANCO.
25.5	22.5	14.5	12.5	9.5 GIBARA

ITINERARY.

This line runs from Holguín to the coast, and is of only local importance. The country through which it passes is a rolling plain, well watered and fertile, but little cultivated and inhabited. A number of small hamlets and villages are reached by this road, mention of them being made in the Table of Distances above.

3. JAMAICA-GUANTÁNAMO RAILWAY.

TABLE OF DISTANCES.

JAMAICA.

6	GUANTÁNAMO.			
11	5	LAS LAJAS.		
13	7	2	CERRO GUAYABO.	
19	13	8	6	CAIMANERA.

ITINERARY.

This is a local line connecting the towns of Jamaica and Guantánamo with the coast [La Caimanera]. It traverses a low region, little cultivated. It is not deemed of sufficient importance to describe further.

5. JARAGUA IRON CO.

TABLE OF DISTANCES.

SANTIAGO.

12	SIBONEY.			
13	1	JARAGUASITO.		
16	4	3	FIRMEZA.	
19	7	6	3	AMERICA.

ROADS.

The principal roads of this province are as follows:

1. From Las Tunas to Holguín, 48 miles.
2. From Las Tunas to Bayamo, 44 miles.
3. From Holguín to Bayamo, 48 miles.
4. From Bayamo to Manzanilla, 37 miles.
5. From Puerto Príncipe to Las Tunas, 92 miles, of which 27 miles are in the Province of Santiago de Cuba.
6. From Bayamo, via Santiago de Cuba, to Baracoa, 196 miles.
7. From Holguín, via Sagua de Tanamo, to Baracoa, 152 miles.

1. LAS TUNAS-HOLGUÍN ROAD.

TABLE OF DISTANCES.

LAS TUNAS.		
23		LAS PARRAS.
48	25	HOLGUÍN.

ITINERARY.

Distances from Las Tunas.	Leaving Las Tunas, the road to Holguín traverses a rolling plain, across many little streams and creeks. The land is but little cultivated and habitations scattering. The road enters Las Parras, 20 miles distant.
20 miles.	From here the road continues on over the vast, dreary waste of rolling prairie for a distance of 12 miles, when it approaches and passes to the right of a range of hills.
32 miles.	Beyond here the country becomes more rough and rugged, with hills first on one side and then on another, until it enters Holguín, at a distance of 48 miles from Las Tunas.
48 miles.	

2. LAS TUNAS-BAYAMO ROAD.

TABLE OF DISTANCES.

LAS TUNAS.		
10		ARENAS.
44	34	BAYAMO.

ITINERARY.

10 miles.	From Las Tunas the road runs in a southerly direction over a fairly level country, fertile and well watered, but little cultivated. In the distance on the left may be seen a few hills. The road enters the village of Arenas 10 miles from its beginning, where it branches, the road on the left going north and connecting with the Las Tunas-Holguín road. The other road leads to Bayamo.
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Beyond Arenas the country appears a little more rough and rugged, with ranges of hills to be seen here and there on either side, until Majibacoa River is reached. Crossing this, the road enters a somewhat low, flat region until it arrives at the banks of the Cuato River. Here is a good river landing. Considerable traffic is brought up from the coast by small boats and loaded into wagons at this point for distribution throughout the interior. Crossing the river, the road enters a level, fertile country, quite thickly inhabited and cultivated, passing many little hamlets here and there along the route, and finally enters the city of Bayamo, where it connects with roads leading to Holguín, Manzanillo, and other towns of more or less importance.

Distances from
Las Tunas.

23 miles.

31 miles.

44 miles.

3. HOLGUÍN-BAYAMO ROAD.

TABLE OF DISTANCES.

HOLGUÍN.

6	GÜIRA.		
12	6	CACOCUN.	
48	42	36	BAYAMO.

ITINERARY.

Commencing at Holguín, this road for a distance of 4 miles traverses a fairly level country, but here it slowly ascends and crosses over into a vast, rolling plain passing through the hamlet of Güira, where the road branches, but comes together again just before reaching Bayamo. Taking the right-hand road, which enters Cacocun, the country is rolling, well watered, and fertile, gradually becoming lower until the Cuato River is reached. Crossing the river, the road continues to traverse a level, fertile plain until Bayamo, its destination, is reached, 48 miles from Holguín.

Distances from
Holguín.

6 miles.

12 miles.

28 miles.

48 miles.

4. BAYAMO-MANZANILLO ROAD.

TABLE OF DISTANCES.

BAYAMO.

37	MANZANILLO.
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ITINERARY.

This road connects the towns of Bayamo and Manzanillo, traversing a fertile, rolling plain, which becomes somewhat low and flat as the coast is approached. The road crosses many streams, over which are good bridges and culverts (an exceptional thing in Cuba). Its length is 37 miles, and while there are no towns or villages of importance along its route, it is considered an important road, being the means of connecting many inland towns with the coast via Bayamo.

6. BAYAMO-BARACOA ROAD.

TABLE OF DISTANCES.

BAYAMO.

18	JIGUANI.																
23	5	BAIRE ARRIBA.															
37	19	14	EL AGUACATE.														
60	42	37	23	COBRE.													
69	51	46	32	9	SANTIAGO DE CUBA.												
73	55	50	36	13	4	EL CANEY.											
86	68	63	49	26	17	13	TIARRIBA.										
93	75	70	56	33	24	20	17	MIJUEL.									
106	88	83	69	46	37	33	20	3	S. ANDRÉS.								
118	100	95	81	58	49	45	32	25	22	GUANTÁNAMO.							
135	117	112	98	75	66	62	49	32	29	7	YATERITA.						
150	132	127	113	90	81	77	64	47	44	22	15	BAITIQUIRI.					
162	144	139	125	102	93	89	76	59	56	34	27	12	MACAMBO.				
179	161	156	142	119	110	106	93	76	73	51	44	29	17	EL JOBO.			
190	172	167	153	130	121	117	94	77	74	52	45	30	18	1	BOMA.		
196	178	173	159	136	127	123	110	93	90	68	61	46	34	17	16	BARACOA.	

7. HOLGUÍN, SAGUA DE TÁNAMO, AND BARACOA ROAD.

TABLE OF DISTANCES.

HOLGUÍN.

15	S. FERNANDO.															
28	13	TACAJO.														
34	19	6	SOCORRO.													
59	44	31	25	MAYARI ABAJO.												
74	59	46	40	15	CABONICO.											
94	79	66	60	35	20	SAGUA DE TÁNAMO.										
117	102	89	83	58	43	23	MOA.									
124	109	96	90	65	50	30	7	CUPEY.								
128	113	100	94	69	54	34	11	4	JARAGUA.							
142	127	114	108	83	68	48	25	18	14	NAVAS.						
147	132	119	113	88	73	53	30	23	19	5	MARABI.					
152	137	124	118	93	78	58	35	28	24	10	5	BARACOA.				

JUDICIAL DISTRICTS, TOWNSHIPS, CITIES, AND TOWNS.

Judicial district (partido judicial).	Township (ayuntamiento).
Baracoa	Baracoa.
Bayamo	{ Bayamo.
	{ Jiguani.
	{ Victoria de las Tunas.
Guantánamo	{ Guantánamo.
	{ Sagua de Tánamo
Holguín	{ Gibara.
	{ Holguín.
	{ Mayari.
Manzanillo	Manzanillo.
	{ Alto Songo.
Santiago de Cuba	{ Caney.
	{ Cobre (El).
	{ Santiago de Cuba.

I. JUDICIAL DISTRICT OF BARACOA.

Area, 1,474 square miles.

Township.	Population.
Baracoa	18,066

1. AYUNTAMIENTO OF BARACOA.

Capital, Baracoa.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Duaba	3½	1,972 inhabitants.
2. Guandao	10	1,940 inhabitants.
3. Jamal	9½	1,702 inhabitants.
4. Jauco	26	876 inhabitants.
5. Sábana	23	2,619 inhabitants.

ROUTE TO BARACOA.

By water from Habana.

BARACOA is a city of 5,072 inhabitants, capital of the judicial district of the same name, situated 167 miles from Santiago de Cuba and 705 from Habana. It is on the extreme eastern part of the island, on its north side, situated 21 feet above the level of the sea. It was the first Spanish town founded by Velazquez in Cuba (1512). It possesses a hospital, post office,

and telegraph station, and became a bishopric in 1513. Its chief industry is the grinding of cocoanuts to extract oil. There are two establishments, with a capacity of 30,000 cocoanuts daily, employing about 50 workmen. There is also a petroleum refinery (closed at present) and a chocolate factory. Bananas and cocoanuts are exported to the United States (\$628,811 worth in 1895), Norwegian steamers being employed, because of their cheapness as compared with the United States vessels. Maisi Cave, near this town, is noted for the relics and bones of the primitive race which are found here. The climate is pleasant, the temperature being 84° F. in summer and 76° in winter. The winds prevailing during the summer are from the southeast.

It is the most important port of fruit trade, and as a seaport ranks sixth in importance. A trimonthly line of steamships touch at this place, establishing communication with the chief northern ports and also with the southern port of Santiago de Cuba. It has a small, circular-shaped, first-class harbor, less than a mile in diameter.

Malarial fevers especially prevail, and at times other kinds of fevers are frequent. There was a terrible epidemic of yellow fever here in 1876-1878 which was singular in three ways, viz: (1) It attacked natives and acclimated persons in preference to foreigners; (2) the disease especially prevailed in the most elevated parts of the town, while the portion along the shore, the lowest and most insanitary part, was exempt from the disease; (3) this epidemic was terribly contagious. Seldom was one member of a family attacked without other persons in the same house being attacked. There has been little yellow fever since then.

SAILING DIRECTIONS.

Port Baracoa may be readily found by the Yunque de Baracoa, or Anvil, 4 miles S. 79° W. (S. 77° W. mag.) from the entrance. This is a remarkable steep and flat-topped mountain, rising to 1,824 feet; it may be seen at a distance of 40 miles. It is partly covered with vegetation, and there are some white and red spots in the break or opening in the rock of which it is composed, visible at some distance. It is a most useful landmark, and its shape, resembling an anvil, prevents its being mistaken for any other mountain.

The shores of the port are bordered by a sand bank, which considerably contracts the anchorage. It is exposed to the prevailing winds, which throw in a heavy sea. At about 35 yards to the NW. of the inner point on the SE. side of the entrance is an isolated rock called the Buren, which uncovers at low tide; the sea always breaks on it; it is steep-to, and the only dangerous point on the shore. Vessels generally anchor close up to town in 3½ to 5 fathoms of water, sand. Except in a small vessel, it can only be left with the land wind; consequently, in the season of the Northerers, a sailing vessel will be liable to some days' detention. The bottom in general is loose, and during fresh northerly winds the port offers but little shelter.

Salutes can be returned by a battery of four guns on the point. The port is the center of a large fruit trade.

The authorities to be visited are the mayor, commander, and the captain of the port.

The United States is represented by a consul and vice-consul.

Winds.—From March to June southerly winds prevail and squalls from south to SW. may be looked for; in fact, they should be looked for at any time. These squalls are of short duration, but a vessel should ride by a fair scope of cable. Remittent fever is at times prevalent at Baracoa, but the place is generally healthy, owing to its exposed position.

Supplies.—Near the pier at Baracoa the Macaguanigua River runs into the sea, where water may be obtained. Fresh meat and fish are to be had at all times. Large quantities of fruit are exported to the United States and the Bahamas.

Light.—About 150 yards ESE. of Barlovento Point a fixed white light, 50 feet above the sea, is shown from an iron column above the keeper's dwelling, and may be seen 9 miles; but its visibility is not to be depended upon.

Tides.—It is high water, full and change, at Baracoa at 7h. 23m., and the rise is about $2\frac{1}{2}$ feet.

Pilots for the old Bahama Channel may generally be got at Baracoa.

Winds and Currents.—All this part of the coast, from Cape Maysi to Baracoa, is exposed during the winter months to the north and NE. winds, which prevail at this season. During the summer, squalls off the land are experienced. The land winds are regular, and spring up fresh generally at daylight, but do not extend far from the coast.

The direction of the current to a short distance from the land is west ward with the flood tide and eastward with the ebb.

Port Mata is only fit, from its limited size and shallow water, for small vessels.

The banks which border the shores leave only a space 300 yards in diameter in the middle of the harbor, having a depth of 15 feet.

The entrance is open to the NE., and in the winter months a heavy swell sets into the entrance.

A bank borders each side of the entrance, and a vessel in entering has only to keep in mid-channel, carrying a depth of 4 to 6 fathoms.

Supplies.—Several small streams of good water empty into the harbor and wood is plenty. Fresh provisions may be obtained from the people in the neighborhood.

Tide.—It is high water, full and change, at Port Mata at 6h. 49m., and the rise is about 2 feet.

PORT BOMA.—This harbor is only the mouth of the river of the same name, forming an inlet $\frac{1}{4}$ mile long and hardly 200 yards wide. The shore at the entrance is of rock, but farther in it becomes a mangrove swamp. The harbor is only fit for coasters seeking temporary anchorage or to load with the products of the neighboring farms. It is open to the northward, and fresh breezes cause a heavy sea to roll in.

PORT MARAVI.—Its shores are of soboruco, but on the west there are three sandy beaches. At the head of the port the land is marshy, with mangroves, and here the river of the same name empties. A bank of sand, gravel, and rock borders the shore, contracting the entrance to about 50 yards, and the anchorage to less than 150 yards in breadth. Therefore, although the water is deep, there being from 9 to 15 fathoms, mud and rock, the port is only fit for small vessels, and in entering the eye will be the best guide. A sailing vessel should leave with the land wind in the morning. This port is, however, exposed to the NE. and not a safe anchorage except under favorable circumstances.

Supplies.—Water may be had from the river, but it is very shallow near its mouth, and dry at low tide. Wood and small supplies of provisions may be obtained.

Tides.—It is high water, full and change, at Maravi at 7h. 56m., and the rise is about 2½ feet.

PORT CUEVA.—About a mile NW. of Port Maravi is that of Cueva, and between is the little port of Aguacate, and the two bays of Cay Güin, thus called from some conspicuous houses of that name seen on the coast. This port is merely an inlet of little more than 400 yards, forming an elbow at its extremity with a sandy shore, in the western part of which the river of the same name empties itself. About halfway in from the entrance to the elbow the breadth is only about 100 yards; the shore on either side is of soboruco, and in the middle of the channel the depth is from 9 to 1½ fathoms, with shallow water on either side; it can only be used by small vessels.

PORT BAY.—Close westward of Cueva is the inlet of Bay, and then for nearly ¼ mile the coast is low and rocky, terminating in Bay Point, which is rather low and almost separated from the coast, having on its lee side an inlet fit for boats. This point is often named Vaez, but the pilots and seamen of the coasters call it Bay.

PORT NAVAS.—From Bay Point the coast trends about NW. by W. 8 miles to Jaragua Point. Nearly a mile from the former is Naguarage Bay, fit only for boats, and the river of the same name runs into it; thence the rocky coast of Navas, with slight indentations, continues for a mile; and about halfway is a salient point named Plata, on the weather side of which there is a small white beach and soboruco above it, by which the point is known. About ¼ mile beyond this is Port Navas, of circular form, 400 yards in diameter, with 5 to 10 fathoms water, and which affords shelter from the prevailing winds; its mouth is 200 yards wide, open to the north, and there is no difficulty in entering.

PORT CAYAGUANEQUE.—From Navas the rocky coast, with three small sandy bays, named Cay Santo, runs WNW. for about a mile to Port Cayaguaneque, which is only fit for very small vessels. The channel at its entrance is about 50 yards wide.

Port Taco is well sheltered. Its shores are bordered by a bank, which also extends along both sides of the entrance to the coast bank outside. The channel at the entrance, which is a little more than 200 yards long, is tortuous and narrowed to about 68 yards in breadth, and the principal anchorage to a space of ¼ mile in a NE. and SW. direction and 350 yards in breadth. The port is therefore difficult and dangerous to enter in a vessel of more than 11 feet draft, although there are 6½ fathoms water at the anchorage, as, with a fresh breeze, the sea breaks against the rocky shore on the lee side of entrance with much force.

It will be prudent for a stranger to take a pilot for Port Taco, but if unable to obtain one, and in case of necessity, bring the outer of the western points of entrance to bear S. 78° W. (S. 76° W. mag.), distant 400 yards, and then steer for the inner point, which is high, steep, and conspicuous; when 150 yards from it, steer about S. 69° W. (S. 67° W. mag.) for 150 yards, and then about S. 24° W. (S. 22° W. mag.), keeping about one-third the distance across from the lee shore, till within the harbor, when anchor as convenient. The edges of the bank are difficult to be seen until close to them. A vessel must have the land wind to leave.

Supplies.—Water, wood, and small supplies of provisions may be obtained.

Tides.—It is high water, full and change, at Port Taco, at 8h. 49m., and the rise is about 2½ feet.

Port Cayo Moa is protected on its northern side by the Cayos de Moa.

The anchorage is about 1 mile long and ¼ mile wide, and is approached through an opening called the Quebrado de Moa, about 600 yards wide in its narrowest part.

Shoals.—Just within the opening in the reef and on a line between it and the mouth of the Moa River is a bank of sand and rock called the Bajo Grande, about ¼ mile in diameter. In some places on this shoal there are less than 2 fathoms of water. One mile west of the Bajo Grande and ¼ mile south of Cayo Grande de Moa is another shoal, of small extent, called the Yagnasey Shoal, the least water on which is 9 feet. Another small shoal spot, ¼ mile farther to the northward, called Palanca Shoal, is generally marked by a stake.

The eastern or weather reef at the entrance to this anchorage is distinctly marked, even in fine weather, by broken water, and the rocks are rather above water than awash. But on the lee or western side of entrance there is nothing to mark the danger for at least ¾ of a mile from the eastern reef. The general body of the shoal extending from Cayo Moa is coral covered with dark weed, which, even with 9 feet of water over it, looks deep; but the SE. end of it is white sand and the bottom can be seen. In standing for this anchorage bring the mouth of the Moa River to bear S. 11° W. (S. 9° W. mag.), on which bearing the opening in the reef will present a fair channel way and the eastern side of the reef be easily distinguished. Or, coast along the weather reef from the eastward, keeping off about 100 yards, or less, if necessary, as 7 to 9 fathoms will be found 30 yards off.

Directions.—The course through the opening is S. 11° W. (S. 9° W. mag.), keeping near the weather side. As soon as the SE. point of Cayo Moa, called Pájaros Point, bears N. 82° W. (N. 84° W. mag.), steer S. 70° W. (S. 68° W. mag.), leaving the Bajo Grande on the port hand, till the mouth of the Moa River bears S. 20° E. (S. 22° E. mag.), then haul up a little more to the westward and anchor in from 11 to 12 fathoms, muddy bottom, with Pájaros Point bearing about N. 28° W. (N. 30° W. mag.), ¼ mile distant.

Tides.—It is high water, full and change, at about 7h. 0m., and the rise is about 3 feet. The flood stream at the eastern end of Cayo Moa Reef sets to the SW. a mile an hour, and the ebb to the northward.

II. JUDICIAL DISTRICT OF BAYAMO.

Population, 30,371.

Townships.	Population.
1. Bayamo.....	17, 719
2. Jiguani	8, 035
3. Victoria de las Tunas.....	25, 360

1. AYUNTAMIENTO OF BAYAMO.

Capital, Bayamo.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Barrancas	15 $\frac{1}{2}$	
2. Bueicito	15 $\frac{1}{2}$	
3. Caurege	9 $\frac{1}{2}$	
4. Cauto del Embarcadero.	18 $\frac{1}{2}$	
5. Dátil	4 $\frac{1}{2}$	
6. Guamo	31	
7. Guisa	13 $\frac{1}{2}$	
8. Horno	9 $\frac{1}{2}$	
9. Laguna Blanca	6	
10. Mangas (Las)	5	
11. Veguita	21 $\frac{1}{2}$	

ROUTES TO BAYAMO.

1. From Santiago de Cuba by pike.
2. From Manzanillo by pike.

BAYAMO is a city of 3,634 inhabitants, capital of the judicial district of the same name, and is situated 93 miles from Santiago de Cuba. It is 25 miles inland from the seaport of Manzanillo, on the highroad from that place to Santiago de Cuba. The nearest station is Holguín, 59 miles distant. Telegraph and telephone.

The city is one of the oldest in Cuba, having been founded prior to 1551. The houses are of stone and there are 11 churches, probably prepared for defense. The town is protected by blockhouses, ditches, and surrounded by barbed wire. A hill 1 mile southeast commands the forts. River Bayamo runs through the town and it is unfordable in the rainy season. Forage, wood, and water are plentiful in the surrounding country. There are no cattle.

Pezuela specifies that malarial fever is the chief disease here. Yellow fever is not prevalent. In 1876 and 1877 Cienfuegos, Santiago de Cuba, and Baracoa suffered with yellow fever; but Manzanillo had little and Bayamo had none, although there must have been many soldiers stationed in the latter city, since there were over 7,000 admissions to the military hospital during these two years. The military statistics show here, as elsewhere, that something more is needed in Cuba than merely an aggregation of men to cause yellow fever. In 1868 there were 316 admissions, 53 of which were yellow fever, while in 1877 there were 4,118, and not one case of yellow fever.

2. AYUNTAMIENTO OF JIGUANI.

Capital, Jiguani.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Babiney		
2. Baire	7	
3. Calabazar	8	
4. Cienfuegos		
5. Rinconada		
6. Santa Rita	6½	
7. Ventas		

ROUTE TO JIGUANI.

From Manzanillo by pike, via Bayamo.

JIGUANI is a town of 1,393 inhabitants, and is situated 21½ miles from Bayamo. The nearest station is San Luís, 59 miles distant. It is the terminus of the calzada (highroad) from Bayamo. It has 22 forts, one of them an old style stone castle, on a high hill (250 feet) on the edge of the town, having two guns. It is said to have the strongest interior work of any fort in Cuba. Yellow fever is said not to prevail to any extent in this town.

3. AYUNTAMIENTO OF VICTORIA DE LAS TUNAS.

Capital, Victoria de las Tunas.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Cauto del Paso	32	
2. Maniabon		
3. Puerto Padre	37	1,651 inhabitants; telegraph station.
4. Santa Maria		

ROUTES TO VICTORIA DE LAS TUNAS.

1. From Habana to Jibara by sea, then to Holguín by rail, and then by pike.

2. From Manzanillo by pike, via Bayamo.

VICTORIA DE LAS TUNAS is a city of 1,791 inhabitants, situated 52½ miles from Bayamo. It is 30 miles from the northern coast at Nuevitas, and 19 miles from the southern coast, lying between the important inland towns Puerto Príncipe and Holguín. There is a post office and telegraph station.

This inland town was founded about 1759. Its commerce is reported to be with the harbor of Manati, which has no port of entry, and is about 35 miles to the north. It was totally destroyed by Garcia, September 4, 1897.

SAILING DIRECTIONS.

Port Padre is a secure and capacious basin, with a depth of at least 4 fathoms in the greater part of it. The western side of this bay is steep-to. To enter the port it is only necessary to keep well off the reef which terminates off Point Jarro, and, when this point bears about S. 45° E. (S. 47° E. mag.), stand into the bay, keeping near the western shore. Steer in mid-channel; with the aid of the chart no difficulty will be found, as there are no hidden dangers. There is a village on the western side of the entrance.

The harbor is nearly divided into two parts. The easternmost anchorage will be found the most convenient for leaving with a sailing vessel. The channel leading to it is between the two islands just inside the entrance.

The shores of the harbor are low and swampy.

Five perches mark the channel into the western branch of Port Padre after passing Point Gracia, one on the NW. end of Cay Puercos, one off the NW. end of Cay Juan Claro—these are to be left on the port hand—and three on the shoal between Puerco Cove and Morena Point, to be left on the starboard hand. There is also a beacon surmounted by a ball, and painted green and white, on a shoal named Esteron in the harbor.

MALAGUETA.—The shore from Port Padre continues its westerly direction for 5 miles to Piedra Point, where there is a small opening leading into Malagueta Inlet, an extensive unnavigable lagoon. The land around is low and swampy. Thence the coast takes a NNW. direction 3½ miles to Cobarrubias Point and then WNW. 7 miles to Port Manati. All this coast is skirted by a reef to the distance of about 2 miles.

Port Manati has a depth of 4½ to 5½ fathoms. It is merely a long, narrow, crooked channel, bordered by shoal banks on both sides and leading into a shallow lagoon surrounded by low, marshy land. The place is only fit for small coasters. On its western side is a conical hill called El Mañueco, and a little beyond it another, not quite so high, called the Pardo or Mesa de Manati. These elevations may be seen 15 or 20 miles, and are good guides for the offing; when seen nearly in a line they resemble the Saddle of Gibara, and if mistaken for it the error might lead to accidents. All this part of the shore is foul, the reef extending off about ½ mile from the entrance of the inlet, through which a channel is formed leading to the port.

III. JUDICIAL DISTRICT OF GUANTÁNAMO.

Population, 22,414.

Townships.	Population.
1. Guantánamo	24,000
2. Sagua de Tánamo.....	6,044

1. AYUNTAMIENTO OF GUANTÁNAMO.

Capital, Guantánamo.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Arroyo Hondo	6	
2. Caimanera (La)	12½	Railroad.
3. Casimba Abajo	7½	Railroad.
4. Casimba Arriba	8½	Railroad.
5. Casisey Abajo	10	
6. Casisey Arriba	8½	
7. Guaso	10	
8. Hatibonico	7½	
9. Jamaica	3	Railroad.
10. Palmar	10	
11. Purial	12½	
12. Río Seco	15	
13. Sigual	9½	
14. Tiguabos	12	
15. Yateras	12½	
16. Yateras Abajo	15	

ROUTES TO GUANTÁNAMO.

From Habana to Batabanó by United Railways, then by sea to port of Caimanera, and then by rail.

GUANTÁNAMO is a flourishing town of 9,000 inhabitants, capital of the judicial district of the same name, and is situated 40 miles from Santiago de Cuba and 17½ miles from the bay of the same name. The commerce is quite extensive, coffee and sugar being the chief exports. It has a theater, an agricultural commission, an industrial commission, a board of commerce, a board of health, a board of charity, and a board of public education. It has also a post office, telegraph, and railroad.

This town was founded in 1843. Although designated a port of entry, the real seaport is the village of Caimanera, located on the west bank of the Bay of Guantánamo and connected with the town of Guantánamo by a railroad. Guantánamo is situated on a plain 115 feet above the sea and on the west bank of the Guaso River. It is encircled by small streams from stagnant pools which cause the prevalence of malarial fevers. Yellow fever is said to be indigenous, not only to the town, but to the country some 5 miles around it. However, from best reports the disease does not prevail with any severity. To the west are hills, and at from 10 to 15 miles distant there are high mountains in every direction except to the south; the land toward Caimanera being for the most part low. The harbor is a very beautiful sheet of water, about 7 miles in diameter, encircled by hills, but portions of the shore are low and marshy. From the south a somewhat narrow entrance, about 6 miles long, leads into it. The

harbor is very deep, permitting even the largest vessels to enter in safety within close proximity to the shore. Guantánamo ranks eleventh among the ports of entry for the United States, and is in the chief coffee-raising section of Cuba. Sugar and lumber in large quantities are sent to the United States.

It is regretted that no detailed description of the fortifications was obtainable. Information comes, however, from a returned Cuban to the effect that in addition to the usual old tumble-down stone forts, new earthworks have been constructed near the harbor entrance, mounted by some modern guns, and that a cordon of earthworks, block houses, and fortinas (small forts) has been extended around the city. The last-named type is especially conspicuous. The little semicircular forts projecting from the corners of buildings at street intersections are also said to be numerous.

SAILING DIRECTIONS.

PORT BAITQUERI.—The entrance between the outer points is nearly 400 yards in breadth, but it narrows to about 90 yards at the inner point, when the harbor opens out to between 400 and 600 yards in breadth and about 1,200 in length. It is sheltered by the mountains which surround it.

The port can be readily recognized by the Pan de Azúcar, which is about 5 miles from the entrance. Vessels bound to Baitiqueri from the southward or from well off shore should steer in with the Pan de Azúcar on a north (N. 2° W. mag.) bearing. When within a mile of the shore the mouth of the harbor will be plainly seen bearing west (S. 88° W. mag.) opening between the high hills or coast mountains, sloping down to rocky points on both the east and west sides, with an inner point of green trees and bushes on the west side. The reefs on both sides of the channel can be seen when close into the land or when 400 yards off shore.

Between the outer entrance points the channel is 100 feet wide, but in the narrowest part it is only 50 feet in breadth, with a depth of 2 fathoms, increasing to 3½ fathoms; the reefs on both sides of the channel are seen when ¼ mile from the entrance.

There is a depth of from 9 to 15 feet water within the entrance, over muddy bottom of a slate color.

Supplies.—The only supplies to be obtained at Port Baitiqueri are wood and fresh water.

Winds.—Between Pintado Point and Baitiqueri the coast is sufficiently protected from north and NE. winds, which prevail during the winter months, except between Pintado and Caleta Points, where the NE. winds, which blow hard, cause much sea. The land winds prevail all the year round at night, and blow fresh during the north and NE. winds, which much facilitates a vessel making easting, if the coast be kept close aboard so as to take advantage of them, as they do not reach far to seaward. From Baitiqueri to Guanós Point the coast can be approached to the distance of a mile, but from the latter point round Cape Maysi the coast should not be approached at night within 6 miles.

Current.—At a short distance from the coast the stream of the flood sets to the westward and that of the ebb to the eastward. The general current runs constantly to the westward during the months of July, August, and September, and its rate varies with the force of the wind.

Port Escondido, or Hidden Harbor, as its name implies, is very difficult to discover until close to it; but the two small hummocks a little eastward of the entrance are a good guide from the southward. The entrance lies between two rocky points, about 200 yards apart, and is 300 yards in a NW. and SE. direction; but both sides are fringed with a coral ledge. that on the windward side extends off about 70 yards, leaving a narrow channel about 80 yards in breadth in the center, in which there are from 4 to 6 fathoms water. The interior opens out into an irregular form, the projecting mangrove points forming inlets of deep water close home to the swampy shores. Many small shoals lie in the way, but they are easily seen.

The port is sheltered from all winds, and fit for large vessels, but no directions can be given. The safest way will be to place a boat on the edge of the water reef, and the eye, with the assistance of the plan, will guide in without much difficulty or risk, even with the wind as far north as NE. There is no fresh water to be found, nor is there any settlement near the shore, and consequently no pilots.

Port Guantánamo, or Cumberland Harbor, $12\frac{1}{2}$ miles westward of Escondido, is capable of admitting vessels of large draft without difficulty, and in safety. The shore between it and Escondido forms small sandy coves, steep-to. This port, which is altogether about 11 miles in length, north and south, may be said to form two harbors; the inner, called the Bay of Joa, has, however, a depth of only from 12 to 15 feet, and the channel leading into it, although deep, is extremely narrow. In the center of the port the shores are deeply indented, forming small secure creeks, very convenient for vessels of light draft.

The entrance is nearly $1\frac{1}{2}$ miles wide, and may be readily made out, and its eastern side is a straight rocky shore $1\frac{1}{2}$ miles in length north and south. Just within the north end there is a low spit of dry sand called Fisherman Point, on which there are palm trees and generally one or two huts. The only danger on this side is a rocky ledge 600 yards in length, running off to the westward from Fisherman Point; on the outer part there is 15 feet. About $\frac{1}{2}$ mile within the outer point is the beginning of a bank, which carries $3\frac{1}{2}$ to 4 fathoms over it; this bank extends westward more than $\frac{1}{2}$ mile, and the most projecting part of it lies with the mouth of the Guantánamo River, bearing about S. 80° W. (S. 78° W. mag.).

On the west side of the entrance to this port there is a lookout house erected on piles.

About $\frac{1}{2}$ mile to the northward of the leeward point of entrance is the mouth of the Guantánamo or Agusta river, in which the depths are from 9 to 15 feet for a considerable distance within. Thence a low sandy shore bends round to the NW. and then NE., forming the north side of the outer port, and near the center of it there is a remarkable whitish brown cliff. A shallow bank or reef borders all this western and northern shore for about 400 yards.

There is a narrow rocky ledge with 18 feet of water on it about $\frac{1}{2}$ mile within the outer points of the entrance. The various accounts of its location do not agree, but its most projecting point is believed to be $\frac{1}{2}$ mile from the western shore and east of the mouth of the Guantánamo River.

Water may be obtained from the Guantánamo River, but the boats will have to proceed up as high as the Barcadero, about 11 or 12 miles from

the mouth. It is also to be had from a small stream on the NW. shore of the inner harbor, the mouth of which is 300 or 400 yards eastward of a remarkable red and white cliff. Near it are some stakes, and over it a remarkably lofty tree. The stream, although not more than 16 to 18 feet wide, is deep enough for launches; but be careful to get out before low water, as then there are only 2 feet on the bar. A place for watering will be found a little way upon the starboard hand, where there is a cleared space on the shore, or on the port hand, where there is a fall.

Pilots will go out to vessels advancing to the line between the point to windward of the harbor and San Nicolas Point. The pilot boats are painted white with a black "P" on bows, and they fly a white flag with blue "P" in center. Rates same as Santiago de Cuba, except at night one-half the regular rate in addition is charged, and for movement in harbor one-third of regular rates. Pilotage is compulsory except for men-of war.

Dues.—No tonnage or light dues.

Cable.—The line of cable is indicated by three posts on Cayo Toro and one on Cayo Caoba.

Light.—It is intended to exhibit a fixed white light, visible 13 miles from a lighthouse erected at the entrance to Port Guantánamo.

Directions.—In approaching Guantánamo from the southward, on about the meridian of 75° 10' W., a remarkable conical mountain will be seen to the NNW., about 15 miles westward of the harbor. As the land is approached this mountain will assume a saddle shape, and a small isolated hill, with two small paps or hummocks near it, will be seen to the westward. The east side of the entrance is a round hilly bluff, barren but of green color; the western point is low and woody. The coast is bold and steep-to, and no soundings will be obtained until within the points. The eastern point can be rounded at 400 yards distance, and when abreast of it steer N. 19° W. (N. 21° W. mag.) for the brown bluff above mentioned on the northern shore. When Fisherman Point is well open haul up N. 24° E. (N. 22° E. mag.), and when it bears S. 77° E. (S. 79° E. mag.) haul up N. 45° E. (N. 43° E. mag.) or N. 56° E. (N. 54° E. mag.) and anchor as convenient, with Fisherman Point bearing from S. 10° E. (S. 12° E. mag.) to S. 20° E. (S. 22° E. mag.).

The eastern shore is quite clear, and a vessel may stand farther in if desired. It will be well for a sailing vessel to wait for the sea breeze to enter and for the land breeze to go out. Should it be necessary to beat in or out, do not stand inside the depth of 6 fathoms, and in standing to the eastward do not bring the brown cliff to the westward of N. 30° W. (N. 32° W. mag.) to avoid the Fisherman Ledge.

If proceeding into the Caimanera, or inner harbor, pass between Hicacal Point and Hospital Cay; when abreast the north end of the latter, steer for the narrow channel between Toro and Caoba Cays, passing about 200 yards westward of Largo Cay; when well through this channel, with Media Cay bearing S. 65° E. (S. 67° E. mag.), alter course for Salinas Point, and anchor off the village with the railway depot on about a west bearing, according to draft.

At Caimanera there are only a few houses and the railway terminus; the town of Guantánamo, 15 miles distant, is connected with it by a railway.

Fresh provisions, fruits, and vegetables can generally be obtained here. There is a telegraph line to Santiago de Cuba. Steamers from Habana call trimonthly, and a semiweekly steamer to Santiago de Cuba.

The United States is represented by a consular agent at Guantánamo.

Light.—A lantern light is exhibited on each of the two angles of the mole head at Caimanera Harbor. The lights are elevated 16 feet above the sea. One lantern has two white and two red glasses; the other, two white and two green glasses, the colored glasses being turned toward the bay; the red light marks the northern, and the green light the southern angle, thus indicating the sides as well as the head of the mole

2. AYUNTAMIENTO OF SAGUA DE TÁNAMO

Capital, Sagua de Tánamo.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Bazan	3	
2. Esteron	9	
3. Juan Diaz	2½	
4. Miguel	2	
5. Zabala	½	

ROUTE TO SAGUA DE TÁNAMO.

By water from Habana.

SAGUA DE TÁNAMO is a town of 981 inhabitants, situated 240 miles from Guantánamo, and 124 from Santiago de Cuba. It is on the river Sagua, near the north coast, 30 miles east of the bay of Nipe. The nearest station is Jamaica, 50 miles away. It has a post office and telegraph station.

SAILING DIRECTIONS.

PORT YAGUANEQUE.—From Port Moa the shore trends westward 10 miles to Yaguaneque, and the reef between extends off for 2 to 3 miles. About 6 miles to leeward of Moa, a mile within the edge of the reef, is Burro Cay, and 3 miles farther on, about ½ mile from the shore, is Arena or Sand Cay. The entrance to the port is through a small opening in the reef ¾ mile to the SW. of the latter cay; but being so narrow and intricate, and the interior merely a shallow lagoon, it is only fit for small coasters.

Cananova, 1½ miles westward of Yaguaneque, is a small narrow inlet of similar character, and is entered through an intricate opening in the reef north of it, which is here only ½ mile from the shore.

Port Cebollas, 4 miles farther westward, is equally difficult of access, and only fit for coasters. The shore is low and sandy, and the reef about ½ mile distant.

PORT TÁNAMO.—From Cebollas the low sandy shore continues westward 9 miles to Port Tánamo, and is again foul to the distance of a mile. Midway between is the mouth of the Sagua River. This port is of considerable extent, and studded with small islets, between which are deep

channels. The cut through the reef and the channel into the port are both very narrow, but the dangers are easily seen, and the eye will be the best guide.

IV. JUDICIAL DISTRICT OF HOLGUÍN.

Population, 64,000; area, 4,183 square miles.

Townships.	Population.
1. Gibara	26,844
2. Holguín	32,500
3. Mayari	8,014

1. AYUNTAMIENTO OF GIBARA.

Capital, Gibara.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Arroyo Blanco	43½	742 inhabitants.
2. Auras	9½	2,525 inhabitants.
3. Blanquizal	14½	1,126 inhabitants.
4. Bocas	12	1,294 inhabitants.
5. Candelaria	6	867 inhabitants.
6. Central Santa Lucía ..	16½	4,000 inhabitants.
7. Corralito	6	67 inhabitants.
8. Cupeicillos	3	425 inhabitants.
9. Fray Benito	10½	1,800 inhabitants. Post office.
10. Jababo	12½	340 inhabitants.
11. Limones	15½	948 inhabitants.
12. Managuaco	14½	394 inhabitants.
13. Palma (La)	10½	500 inhabitants.
14. Pedregoso	13	665 inhabitants.
15. Potrerillo	5½	1,334 inhabitants.
16. San Arriba	18	2,780 inhabitants.
17. Victoria	2½	375 inhabitants.
18. Yabazon	9½	1,260 inhabitants.

ROUTES TO GIBARA.

From Habana by sea.

GIBARA (or Jibara) is a town of 4,608 inhabitants, and the seaport of Holguín, which is 25 miles distant. There is a highroad between these cities and also a narrow-gauge railroad, with blockhouses every 800 yards. There are no seacoast fortifications. The population is composed of Spaniards and Canary Islanders; it is pro-Spanish in every possible way, and there are few Cubans.

The surrounding country is mountainous, but Gibara is only about 18 feet above sea level. It is a port of entry of very little consequence, located on the west bank and near the broad entrance to the harbor of Gibara. Pezuela states that as a rule the usual depth of the harbor does not exceed two fathoms, and therefore only coasting schooners can enter it. Hazard states that the bay is very beautiful and spacious, though not deep enough to permit vessels coming up to the wharves, so that they are compelled to anchor some distance off, and be loaded by means of lighters. The town is said to be healthful except in rainy seasons, when malarial fever prevails. Death rate 32-40 per 1,000. Yellow fever is said to be indigenous to this place, but according to military reports there was only one case in 6 years.

The town has a public theater, a second-class college, 4 municipal schools, 2 private schools, a church, a civil hospital, a military hospital and clinic, a board of education, a board of charity, and a board of health. Post office and telegraph station.

SAILING DIRECTIONS.

Gibara is merely a small bay open to the northward, having a depth of $3\frac{1}{2}$ fathoms just inside the points of the entrance.

Three small hills to the southward of the port, and which from the offing resemble islands, serve as landmarks for this vicinity. The easternmost of these is called the saddle of Gibara; the middle one is shaped like a sugar loaf, and the westernmost is called Mount Candelaria. The town is on the west side of the bay, and can be seen at a distance of 9 miles.

To enter the harbor it is only necessary to bring the entrance well open and steer in half way between the points of entrance.

There is said to be a bank near the middle of the bay called the Casco de San Vicente, but no definite information can be given as to its exact location or depth of water. It may, however, be avoided by keeping the eastern shore aboard. Although there is no shelter from northerly winds and the harbor is only fit for small vessels, it is the port of Holguín, a large town about 15 miles inland in a highly productive part of the country.

Buoy.—A red buoy, surmounted by a vane painted white, has been placed to mark the extremity of the reef extending northwestward, off Peregrina Point. The buoy is moored in 21 feet of water 33 yards N. 22° W. (N. 24° W. mag.) from a small pinnacle which has 13 feet over it at low water, but over which the sea breaks with winds between NW. and east.

There are 26 feet of water 11 yards west of the buoy and at 100 yards there are 52 feet.

Light.—Gibara Light is exhibited from a lighthouse erected on Peregrina Point. The light is fixed white, elevated 39 feet, and visible 7 miles.

The tower and keeper's dwelling are painted white.

PORT SAMA.—From Gorda Point the coast trends about NW. by W. 6 miles to Sama Point, which is $3\frac{1}{2}$ miles eastward of the port of the same name. All this part of the shore is clean and steep-to, and about midway is the small Seco River at the head of a sandy bay. Port Sama is a small inlet about $1\frac{1}{2}$ miles long, north and south, from 200 to 400 yards wide,

and only fit for vessels drawing not more than 11 feet water. The entrance may be readily found by the Pan de Sama, which rises south of it. To the westward of the port there is also the tableland or flat-topped ridge of mountains running NW. and SE., and its west end is bold, scarped, and of a whitish appearance.

PORT NARANJO.—Between Sama and Naranjo, 5 miles westward, the shore is composed of sand and named Guarda-la-vaca. To the southward of it there is a detached sugar-loaf hill and to the SW. the table of Naranjo, a small wooded mountain with a flat summit. Naranjo lies between these two objects, and about 3 miles to windward of it there is a remarkable red cliff, and on the east side of the entrance there is also another of the same appearance, high and scarped. The shore between it and Sama is foul to the distance of about $\frac{1}{2}$ mile. The entrance to the port is only 200 yards wide, but it opens out into an irregular-shaped basin containing several inlets deep enough for vessels of all classes, sheltered from all winds, and they can sail in or out of it with the usual sea breeze.

In entering this port a berth should be given to the reef skirting the weather coast until the eastern point of entrance bears S. 3° E. (S. 5° E. mag.), then steer in, giving the point a berth of 200 yards to avoid the shallow sandbank which surrounds it at a distance of 150 yards. Care should also be taken to guard against the sandbank bordering the lee side of entrance, and which extends northward 350 yards from the outer scarped point. Having passed through the middle of the channel by the eye, anchor about 150 yards off a marshy and mangrove shore on the eastern side, in 9 fathoms water; or proceed farther up into what the fishermen call the Carénage or western bight. The best berth here will be in about 8 fathoms, with the center of the table of Naranjo S. 69° W. (S. 67° W. mag.), and the north point of the Carénage in one with the red cliff at the entrance about north. The table of Naranjo from this quarter has a conical appearance.

Wood and Water.—There is good wooding and watering; the latter a stream on the southern shore at the head of the Carénage, abreast the table of Naranjo: but there will be some difficulty in finding the opening in the bushes leading to it.

Tide.—The rise of the tide at Port Naranjo is $3\frac{1}{2}$ feet.

PORT VITA.—From the entrance to Port Naranjo the shore trends WNW. 2 miles to Pesquero Nuevo Point, which is scarped and clear of danger, and then SW. 3 miles to Port Vita. This part of the coast is low, sandy, clean and steep-to. Vita is a small, narrow, irregular-shaped inlet, which may be used and easily piloted by vessels drawing under 18 feet.

PORT BARIAY.—Three miles westward of Vita is Bariay, and a mile farther Jururu; the shore between is clear of danger. Port Bariay is open to the northward, and therefore not safe in the winter months; but there is good temporary anchorage close under the weather shore off the second sandy beach from the entrance. Farther in the channel is obstructed by a shoal, on which there is as little as 6 feet of water.

Port Jururu is more extensive than that of Bariay, and the interior completely sheltered, with a depth of 4 fathoms; but the entrance is narrow, rather tortuous, and only fit for small fore-and-aft rigged vessels of light draft.

2. AYUNTAMIENTO OF HOLGUÍN.

Capital, Holguín.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Alfonsos (Los)	20	Railroad and telephone.
2. Amasabo	8½	
3. Banes	-----	
4. Barajagua	29	
5. Cacocun	12½	Post office.
6. Cauto Cristo	-----	
7. Cruces	10½	
8. Cuaba	5	
9. Entrada	18½	Post office.
10. Guabasiabo	12½	
11. Guanabana	3	
12. Güirabo	2½	
13. Güiros	12½	
14. Hatillos	8½	
15. Martillo	18½	
16. Matatoros	5	
17. Parras	34½	
18. Pedernales	3	
19. Purnio	7½	
20. Retrete	35	
21. Sama	50	
22. San Augustin de Aguarras.	31	
23. San Andrés	15	
24. Santa Clara	12	
25. Tacajó	31	
26. Tacámara	31	
27. Uñas	10½	
28. Uñitas	11	
29. Vega (La)	14½	
30. Velasco	15½	Post office.
31. Yareyal	6	
32. Yaya	18½	
33. Yayal	5	

ROUTES TO HOLGUÍN.

1. From port of Jibara by rail.
2. From Manzanillo by pike, via Bayamo.

HOLGUÍN is a city of 5,400 inhabitants, capital of the judicial district of the same name; situated 174 miles from Santiago de Cuba. This inland town, founded about 1720, is about 25 miles south of Gibara, its seaport.

It is situated upon a plain of considerable elevation, and possesses the best physical conditions. Yellow fever and cholera were not known here until 1851. It is noteworthy that Holguín did occasionally escape an epidemic of yellow fever when Gibara, its seaport, did not, but whenever Gibara escaped so also did Holguín. It is a point of great military importance, and until 1878 was occupied by a large garrison.

The surrounding country is elevated and hilly. There is an earthwork with 4 guns on the highest point of a hill about one-half mile west of the town, and ditched blockhouses of brick and stone encircle the place. Earth is thrown up around the blockhouses to the loopholes. There are four or five churches in the town, all pierced for musketry, with banks of earth around the bases. The place has had a garrison of 3,000 (inclusive of mounted guerrillas), mostly regular infantry. Including the earthworks already mentioned, there are 10 guns in the position. The houses are almost all stone or brick. Barbed wire is used to form an entanglement around each blockhouse, and also between blockhouses, and there are earthen parapets in streets for interior defense.

This city is the residence of the military governor, has a board of education, a committee on charity, a committee on prisons, civil and military hospitals, market place, plaza, park, and two churches. It is divided into two districts, viz, north and south. Post office and telegraph station.

3. AYUNTAMIENTO OF MAYARI.

Capital, Mayari.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Arroyo Blanco	10	
2. Arroyo Hondo	$\frac{1}{2}$	
3. Barajagua	33 $\frac{1}{2}$	
4. Braguetudos	-----	
5. Cabonico	25	
6. Chavaleta	$\frac{1}{2}$	
7. Féname	34	
8. Megía	36 $\frac{1}{2}$	
9. Sabanilla	33 $\frac{1}{2}$	
10. Santa Isabel	17 $\frac{1}{2}$	
11. Sojo	16 $\frac{1}{2}$	

ROUTES TO MAYARI.

1. From Habana by sea to Bahía de Nipe, then by pike.

MAYARI is a town of 1,854 inhabitants, situated 58 miles from Holguín. This village is located on the west bank of the river Mayari, about 5 miles south of the harbor of Nipe, a harbor on the north coast between Jibara and Baracoa. The river Mayari is navigable to the town. It is not a port of entry, nor has the harbor of Nipe any such port. The place is of no commercial or any other importance. The three cities of note nearest the

Mayari are Holguín, Baracoa, and Santiago de Cuba. However, it is from 50 to 80 miles distant from these three places, and communication is infrequent and over difficult wagon roads. The nearest station is San Luís de las Enramadas, 56½ miles away. It has mines of magnetic iron ore which are not worked. This place seems to be quite exempt from the ravages of yellow fever.

SAILING DIRECTIONS.

PORTS CABONICO AND LIVISA.—From Tanamo a low sandy shore, still bordered by a reef to the distance of about 2 miles, trends westerly for 9 miles to the entrance of the ports of Cabonico and Livisa. These ports are entered through a narrow deep channel about 200 yards wide. About ¼ mile within the entrance a narrow neck of land divides the interior into two channels; the easternmost leading into Cabonico, the other into Livisa. Both are very tortuous and intricate, but have sufficient water for vessels of large draft. Most of the dangers are seen, and the eye will guide in mid-channel.

PORT NIPE.—From the entrance to Cabonico the coast trends WNW., 5 miles to Port Nipe. In this space the reef skirts the shore at about a mile until close to the entrance to Nipe, where it extends off only ¼ mile. Port Nipe is about 9 miles in extent east and west, and from 3 to 7 miles in breadth. It is quite secure against all winds, and will admit vessels of the largest draft without difficulty. The entrance is from ¼ to ½ mile wide, and all that is necessary in entering is to steer in mid-channel; the tides run very strong in the narrows. After passing the inner points of entrance, keep the northern shore aboard until within Mangle Point, from which a shoal extends to the NNE. ¼ mile, when anchor as most convenient, in 6 to 9 fathoms water; the edges of the shoals are marked by stakes.

A sailing vessel will have to wait for the land wind to take her out, which, as before stated, in the winter season is frequently interrupted by Northers for some days.

MOUNT SAMA.—The land in this neighborhood is remarkable. About 10 miles inland the Cristal Range, a continuation of the Baracoa Chain, rises to a great height. To the NW. of Port Nipe there is also a lofty ridge of mountains rising from the shore at Mulas Point to the Pan de Sama, a hill of rounded form 918 feet above the sea, with some long tableland close to the westward, and a peaked hill to the east of it; it can not well be mistaken, and may be seen 20 miles. The two ranges are separated by an extensive valley, which also serves as a good guide.

PORT BANES.—From the entrance to Nipe a bold and steep coast trends to the NNW. and NW. for 9 miles to this harbor, which is also well sheltered, and of sufficient depth for large vessels. Its entrance, however, lies at the bottom of a bay or funnel 2 miles wide in the outward part, and completely exposed to the usual trade wind. The channel into the port narrows to 300 yards, and the turnings are so sharp that it is very difficult pilotage. In leaving, make sure of a good offing before the heavy wind fails, as the vessel will be on a dangerous lee shore and exposed to a heavy sea and lee current.

V. JUDICIAL DISTRICT OF MANZANILLO.

Population, 25,735; area 1,343 square miles.

Towship.	Population.
Manzanillo.....	10,736

1. AYUNTAMIENTO OF MANZANILLO.

Capital, Manzanillo.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Blanquizal	2½	
2. Calicito	7½	
3. Campechuela	18½	
4. Caño	4½	
5. Congo	5	
6. Ingenio Esperanza	-----	
7. Jibacoa	11	
8. Media Luna	41	
9. Niguero	49½	
10. Velic	56	
11. Vicana ..	43½	
12. Yara	12½	
13. Zarzal	18½	

ROUTE TO MANZANILLO.

From Habana to Batabanó by Western Railroad; then by sea.

MANZANILLO is a city of 10,736 inhabitants, situated on a bay, 157 miles from Santiago de Cuba. It has a charity hospital, five military hospitals, a health commission, a charity board, and a board of education. Three first-class colleges and one second-class, three biweekly periodicals, and a market place given by D. José Muñiz Piá. It has eight sugar mills, which send out 31,200 tons of sugar annually. Its commerce is flourishing. Telephonic communication with the jurisdiction. Post office and telegraph station.

This town, founded in 1784, is the seaport of Bayamo and Jiguane. It is said to be a very unhealthful place and very uninviting in appearance. The death rate is 40. Yellow fever is said to be indigenous to this place, but deaths occur principally among the soldiers. It is a port of entry, but of little importance, ranking only twelfth among the Cuban ports of entry. It has no inclosed harbor, but a roadstead protected by islands. It is the great center of the lumber trade. This product is floated down the river Cauto, which is the largest in the island. It empties into the sea slightly to the west, and from there the logs are pushed along the shore by men,

wading the entire distance to the city. Not a dangerous hole exists in such a range of beach. The Cuban charts indicate that the water is so shallow that a depth of 30 feet is marked 3 miles distant from the shore. About three-fourths of a mile north the river Yara flows into the sea. This formerly supplied all the drinking water, but now there are many cisterns. Between Yara and the town lie extensive mangrove swamps, bathed partly by fresh and partly by salt water, so that there are many stagnant pools there during the rainy season.

The town is on flat ground, the center having an elevation of about 12 feet. The surface soil is of yellow clay, very adhesive when wet and very dusty when dry. Porous stratified limestone abounds. Manzanillo covers 160 acres. The streets are 40 feet wide, straight, and at right angles, forming blocks of 4 lots, each measuring 65 by 82 feet.

The seacoast defenses are of little importance, but landward there is an array of small forts, fortinas, blockhouses, and rifle pits. For over three years the nightly intervals between sentry calls about the town has been fixed at fifteen minutes. Some of the hardest fighting of the insurrection has occurred in this vicinity.

SAILING DIRECTIONS.

MANZANILLO.—From Cape Cruz the coast takes a NE. direction for about 55 miles to the anchorage of Manzanillo. The United States is represented by a consular agent.

Submarine Cable.—A submarine telegraph cable has been laid between Manzanillo and Cienfuegos, with intermediate stations at Santa Cruz del Sur, Júcaro, Tunas de Zarza, and Casilda.

Manzanillo Bay lies between the mouth of the Yara River on the north and Caimanera Point on the south, 3 miles apart. The shores are low and covered with mangrove trees, and the water is shallow.

Pilotage.—Vessels up to 45 tons, \$22 (Spanish gold); 45 to 80 tons, \$26; 81 to 120 tons, \$28; 121 to 150 tons, \$32; 151 to 175 tons, \$38; 176 to 200 tons, \$42; 201 to 300 tons, \$48; 301 to 400 tons, \$52, and \$5 additional for each additional 100 tons. For vessels of 600 tons and upwards, \$67. Going to or leaving dock, day \$3, night \$6. Changing berth, day \$2.50, night \$5.

All vessels, no matter what their tonnage, which take pilots off Cape Cruz up to the passage of Cuatro Reales for the port of Santa Cruz del Sur, pay the maximum of pilotage, \$67 Spanish gold.

Beacons.—Nine wooden beacons, each showing 10 feet above high water, mark some of the dangers between Cape Cruz and Balandras Reef. White beacons, each with a square top mark, are on the eastern side of the channels; and red beacons, each with a triangular top mark, point upwards, are on the western side.

Barcos Channel is a passage farther to the westward, leading to the anchorage of Manzanillo, but it is not well known except to the pilots.

Tides.—It is high water, full and change, at Manzanillo at 10h. 40m.; the rise 2 or 3 feet. The water is highest during the months of September and October, with the wind from south and southwest.

VI. JUDICIAL DISTRICT OF SANTIAGO DE CUBA.

Townships.	Population.
1. Alto Songo.....	12,000
2. Caney.....	10,000
3. Cobre (El)	8,261
4. Santiago de Cuba.....	

1. AYUNTAMIENTO OF ALTO SONGO.

Capital, Alto Songo.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Morón (Paradero de).....	7	
2. Socorro.....	7	
3. Tiarriba.....	11	

ALTO SONGO is a town of 500 inhabitants, situated 31 miles from Santiago de Cuba. It is the highroad to Guantánamo. It has unworked mines of manganese. The nearest station is Cristo, 6 miles away. It has a telegraph station.

2. AYUNTAMIENTO OF CANEY.

Capital, Caney.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Barajagua.....	5	
2. Cristo.....	5	1,000 inhabitants. Railroad from Sabanilla to Maroto.
3. Damajayabo.....	15	
4. Dos Bocas.....	2½	
5. Guaninicun.....	7½	
6. Lagunas.....	3	
7. Naranjos.....	3½	
8. Poblado de San Vicente.	2	1,200 inhabitants. Railroad.
9. Sevilla.....	7½	
10. Zacatecas.....	½	

CANEY is a town of 1,000 inhabitants, situated 3½ miles from Santiago de Cuba. Iron mines here. Post office and telegraph station.

3. AYUNTAMIENTO OF COBRE (EL).

Capital, Cobre (El).

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Aserradero	37	
2. Botijas	3½	
3. Brazo Cauto	25	
4. Caimanes	12½	
5. Cayo Smith	12½	
6. Dos Palmas	18½	
7. Ermitaño	4½	
8. Hongolosongo	9½	
9. Manacos	25	
10. Masío	50	
11. Nimanima	59	
12. Río Frío	9½	
13. San Bartolo	12½	
14. Sevilla	62	
15. Suená el Agua	12½	

COBRE (EL) is a town of 715 inhabitants, situated 12½ miles from Santiago de Cuba. Telegraph station.

This town was founded in 1558. It is located on the southern side of Mount Cobre, in a wild mountain region, long celebrated for its numerous copper mines, some of which were worked as early as 1824. One, owned by an English company, is still in successful operation. Its shipping point is Punta de Sal, on the west side of the harbor of Santiago, and about 2 miles from the city. A ferry connects these two points, and since 1848 there has been a horse railroad from Punta de Sal to Cobre, which is about 5 miles distant by road. The cars are reported to run only three or four times a week. Yellow fever has never been known to prevail here. A few soldiers are attacked during July and August, and now and then an unacclimated Spaniard, but the attacks are not severe.

4. AYUNTAMIENTO OF SANTIAGO DE CUBA.

Capital, Santiago de Cuba.

Outlying villages.	Distance from capital.	Remarks.
	<i>Miles.</i>	
1. Aguacate	3 $\frac{1}{2}$	6,000 inhabitants.
2. Arroyo Blanco	27	
3. Canto Abajo	23	
4. Canto Baire	23	
5. Concepción de Tiarriba.	18	
6. Corralillo	20	
7. Cuchillas		
8. Dajas	5	
9. Dorados (Los)	25	
10. Dos Caminos	2 $\frac{1}{2}$	
11. Enramadas (San Luís de las).	16 $\frac{1}{2}$	
12. Fraternidad		
13. Janato	18	
14. Juan Varon	29	
15. Luz (La)	10	
16. Majaguabo		
17. Montes dos Leguas		
18. Palestina		
19. Palma Soriano	21	
20. Ramón de las Yaguas.	25	
21. Remanganagua	33	
22. San Leandro	15	
23. Santa Feliciana		
24. San Vicente	3 $\frac{1}{2}$	
25. Sitios	20	
26. Socapa (La)	4	
27. Songo	13	
28. Vega Belleza		
29. Vega Botada		
30. Yaguas	28 $\frac{1}{2}$	
31. Yarayabo	16 $\frac{1}{2}$	

MORÓN (or San Nicolas de Morón).—This inland village is located about 9 miles north of the city of Santiago and 34 miles south of Mayari. It must not be confounded with a larger town of the same name 200 miles to the northwest, in the province of Santa Clara. The place is of no interest except as a military post.

ROUTES TO SANTIAGO DE CUBA.

1. From Habana to Batabanó by United Railways, then by sea.
2. From Holguín by pike.

SANTIAGO DE CUBA is a city of 42,000 inhabitants, capital of the province, situated 815 miles from Habana. It is the residence of the archbishop, of a military governor depending upon the general of the island, of the mayor, and of the state officials. It has many notable buildings, among which are the cathedral, erected in 1522, and the market square. It has hospitals, schools, a board of health, a board of charity, and boards of agriculture, industry, and commerce.

The city was founded in 1514 by Velazquez, and the famous Hernando was its first mayor. It is the most southern place of any note on the island, being on the twentieth degree of latitude, while Habana, the most northern point of note, is $23^{\circ} 9' 26''$ north latitude. The surrounding country is very mountainous, and the city is built upon a steep slope. The public square, or Campo de Marte, is 140 to 160 feet above the sea, and some of the houses are even 260 feet above sea level. The character of the soil is reported to be more volcanic than calcareous, and the town has suffered repeatedly from earthquakes. It is the second city in the island with regard to population, being slightly larger than either Matanzas or Puerto Principe. So far as American commerce is concerned, it ranks only ninth among the fifteen ports of entry. It is located on the extreme northern bank of the harbor of Santiago de Cuba, a harbor of the first class and one of the smallest, hence it is liable to ship infection.

The mean temperature in summer is 88° and in winter 82° . During the months of July and August the heat is suffocating. This place is regarded as very unhealthful, yellow fever being prevalent throughout the year, and smallpox epidemic at certain times. This disease attacks strangers especially, natives rarely, and negroes never. The bad sanitary conditions are due to the lack of hygienic measures. All refuse matter is thrown into the streets to decay and fill the air with disease germs.

A railroad, called the Sabanilla and Maroto, runs from the city to San Luis, 25 miles distant, with a branch, 12 miles in length, to Alto Songo. It is largely owned and controlled by citizens of the United States. Santiago is the headquarters for three large mining plants owned by United States citizens, viz, the Jurugua, the Spanish American, and the Sigua, together representing the investment of about \$8,000,000; the largest of these, however, is not in operation. There are a number of tobacco factories, but the chief business is the exportation of manufactured goods and provisions. Sugar, iron ore, manganese, mahogany, hides, wax, cedar, and tobacco are exported to the United States.

According to the chart of the Madrid hydrographic bureau, 1863, this harbor is 5 miles long from its sea entrance to its extreme northern limit, the city being located 4 miles from its entrance, on the northeastern side of the harbor. The entrance is for some little distance very narrow—not more than 220 yards wide—and may be considered about 2 miles long, with a width varying from $\frac{1}{4}$ to $\frac{1}{2}$ of a mile. For the remaining 3 miles the harbor gradually widens, until at its northern extremity it is about 2 miles wide. The city is so situated in a cove of the harbor that the opposite shore is only $\frac{1}{4}$ mile distant. At the wharves from 10 to 15 feet of water is found, and within 300 to 500 yards of the shore from 20 to 30 feet. This is probably the anchorage ground. Three or more so-called rivers, besides other streams, empty into this harbor, and one of these, the Caney River, empties into the harbor at the northern limit of the

city, so that its water flows from one island extremity through the whole harbor into the sea. The difference here, as elsewhere in Cuba, between low and high tide, is about 2 feet.

Among the prominent forts are the following:

Cayo Ratones, or Rat Island, located near the middle of the bay, is the Government depository for powder, dynamite, and other explosives.

"La Bateria Nueva de la Estrella" is mounted with four revolving cannons.

Castillo del Morro.—This rises from the water's edge on the extreme front of the westward side of the harbor entrance. It is perhaps more picturesque and extensive than its Habana namesake, rising by terraces from the water with batteries at the front to a height of 150 feet or more. While once most formidable, it shows as great neglect as any garrisoned fortification in Cuba. The walls are crumbling in many places, while rust could be scaled from the old cannon by hand. No doubt this work has been greatly strengthened, as would be easy to do by channeling into the rocky hillsides.

The Spanish description says: "Located on the shore of the bay below the city and has raised parapets." Its distance from the first houses of the city is about 7,700 yards. It is divided into the parapets of Trinidad, 40 yards frontage; Napoles, 22 yards; Aljibe, 28 yards; La Plataforma, more than 97 yards, and Morrillo, with more than 26 yards. The lowest one is 10 yards above the level of the sea. The guard designated for this battery is 230 infantry and 50 artillery. In 1859 it had for defense eight cannon of various calibers—six for 16-pound shot, two for 12-pound shot, and six for 8-pound shot; seven howitzers and four short guns for 9-pound shot; in all, thirty-three pieces.

Castillo de la Socapa.—Opposite the Morro, on the westward side of the harbor entrance, stands this fortification, of somewhat more modern structure, but not nearly as extensive as the Morro. It is also decidedly *passé* in the character of its armament, but, like the works on the eastern side of the entrance, could be easily strengthened.

Bateria de Cabanas.—This stands on the open sea front, westward from the last-mentioned fort, and is described in the Spanish work as follows: "Situated 4,900 yards south of Castle Morro and a little more than 2 above the level of the sea; garrison of 40 infantry and 9 artillerymen, and defended by numerous 24-pounders and one 4-pounder."

Bateria de la Estrella.—This is within the harbor entrance and described as follows: "Erected 340 yards north of Morro and 7 yards above the sea level. An extensive battery to impede the passage of the entrance to the port, it was guarded by 88 men of infantry and artillery, and defended by ten 24-pounders and four howitzers of 9 pounds."

Bateria de Someruelos.—This is also within the harbor, and is described as follows: "Two hundred and twenty-five yards from Cabanas and 64 yards above the sea level. The guard is small and defends four cannons of small caliber."

Fortaleza de Aguadores.—This is located outside the bay, on the open sea, to the eastward, and is described as follows: "Situated 1,860 yards to the east of Castillo del Morro and 9,720 yards from Santiago de Cuba. Is guarded by 62 infantry, 22 artillery, and has four 24-pounders and two mortars, distributed in four batteries." This armament was particularly obsolete in its character.

Bateria del Sardinero.—This is another unimportant work on the open sea, now probably abandoned. It is described as follows: "Situated 14,588 yards from Santiago de Cuba, and 9,722 yards from Castillo del Morro, and 4,860 yards from the fortification of Aguadores. It is guarded by 6 artillery and 26 infantry, defended by one 24-pounder and one 4-pounder."

It should be said of all the fortifications mentioned, as well as others in this locality, that the stone of which they are built does not apparently withstand the weather as well as that used to construct similar works farther westward in Cuba, and that some of the construction material here used is a very soft sandstone.

Before proceeding further, reference should be made also to the fact that from the commencement of the revolution, the spot above all others where the insurgents schemed to blow up a Spanish man-of-war, was at this harbor entrance. To do this, there were all sorts of plans, including the stretching of a wire cable across, under the water, with two extemporized torpedoes attached near the ends, the whole affair to be so arranged that the vessel's prow would strike the center of the cable and by her momentum bring the torpedoes against her sides. No doubt the Spaniards have taken advantage of the splendid natural facilities of the locality to do some submarine work, and if so, it is an extremely unsafe spot to say: "D—n the torpedoes."

Proceeding inward the whole range of bluffs to the east of the harbor and in close proximity to the main channel are doubtless fortified.

At the last small point of the eastern shore, shown on the military map, next below the city, is located the expensive and extensive iron pier of the Juragua Mining Company, which extends out into the harbor nearly one thousand feet. The heaviest draft vessels can lie directly beside this, but not far from this and, in fact, at many points of the inner harbor are shoals and mud banks.

Back of this pier to the southeast rises a hill 200 feet or more in height, which affords a most commanding range of the entire city and inner harbor; it is probably the best available location anywhere in the vicinity. It is entirely cleared, except for a single house with its outbuildings situated at the top. Between this and the city on another conical hill of much less height, is located El Fuerte de Punta Blanca, a sandstone, semicircular, double-tiered redoubt. Its armament consisted of small ancient smoothbores, of which about a dozen were mounted. The strength or natural importance of the work was not great, but an important reserve magazine was located here, principally for small arms and ammunition. Information is had to the effect that the immediate vicinity of the fort is now covered by new earthworks, fronting both to the harbor and inland, in which direction one of the important main thoroughfares to the city is covered.

The gas works are adjacent to the fort just mentioned. It is understood that these have not been operated for some little time, the coal supply having been seized by the Government.

Slightly west of this point commences the Camino Militar (Military Road) which skirts the city to the eastward but subsequently, circling to the west around its northern side, connects at the northwest corner of the town with the Paso de Concho, which, with the broad Calle de Cris-tiana along the water front, completes the line of roads around the city.

From the high-sounding titles given to these streets and from the fact that this arrangement was planned for military purposes, the natural conclusion would be that these roads must all be excellent. However, such is not the case. The Camino Militar is exceedingly hilly and at places rough; the Paso de Concho is smoother but has some grades, while the Calle de Cristiana, running along the water front is naturally level, yet during the rainy season it has bad holes, even in front of the busiest parts of the city. Practically every street has excessive grades at certain points, those running from the east to west having the least. All streets are narrow, poorly paved, and filthy. The rugged hills rise closer to the city from the east and northwest than from other directions.

The cordon of military roads mentioned is farther inland and, for practically the entire length, is fortified. The fortifications are principally of the blockhouse and fortina type, intended solely to keep out the insurgents. There are, however, certain older works which aspire to greater distinction, although lightly armed.

Commencing on the line of Camino Militar, is El Fuerte con Artillería, a redan battery mounting perhaps half a dozen of the heaviest guns on the island fortifications (4 to 5 inch caliber). Next is El Fuerte Santa Ursula, an oblong redoubt, mounting more guns, but of smaller caliber. Farther to the left is the Caballería Cuartel (permanent barracks) which would accommodate probably 200 troopers. Next are the permanent artillery barracks, where some guns are mounted, as is said to be also the case on the adjacent grounds of the permanent military hospital. Slightly west of this is El Fuerte Santa Inez, an oblong redoubt. Well toward the heart of the city are permanent military barracks, and at various points along the Calle de Cristiana (on the water front) a few rusty smoothbores are mounted without protection.

SAILING DIRECTIONS.

Nueva Salamanca, formerly Baiguiri, about 22 miles eastward of Santiago de Cuba, is the shipping port of some rich iron mines about 8 miles inland. A breakwater is in course of construction for the protection of the harbor. The ore is principally shipped to the United States.

Santiago de Cuba will admit vessels of the largest draft, entirely sheltered from all winds. Its locality is indicated from a distance by a remarkable valley, separating the eastern from the western spur of the Cobre Mountains.

The lofty mountain of Turquino is 56 miles west of Santiago, and in clear weather may be seen from the north coast of Jamaica. Gran Piedra, 5,000 feet high, is 20 miles to the eastward.

Morro Castle, on the eastern side of the entrance, is a rather large terraced fortification, standing on the western extremity of a flat ridge about 200 feet high.

The entrance to the harbor is about 200 yards wide. After passing Smith Cay the channel widens, and, although the course is crooked, the sea breeze is generally a fair wind up to the city.

Light.—A lighthouse, built of iron, stands 100 yards eastward of Morro Castle, and exhibits a white light, which shows a fixed, bright light for 50 seconds, and then flashing for 10 seconds, at 228 feet above the sea, and should be seen in clear weather 22 miles, but it can not always be depended upon.

Steam tugs are in readiness to tow sailing vessels in or out of the port if required. Charges vary from \$15 to \$30, and should be agreed upon beforehand.

Diamante de Afuera Shoal, just to the west of the entrance, is probably laid down a little too far off shore. The pilots state that the sea in heavy weather breaks upon it. After passing the shoals a vessel may haul up for the city and anchor as convenient. The depth gradually decreases toward the northern part of the harbor.

Buoys and Beacons.—A red cylindrical buoy surmounted by a lattice-work pyramid, on which is a small vane, is moored on the extreme of Diamante Shoal in 30 feet of water, low spring tides. It shows a white light at night.

A white post surmounted by a triangular-shaped vane marks the SW. extremity of Gorda Bank. It shows a red light at night.

Colorado Shoal buoy is a cylindrical iron buoy, carrying a triangular pyramid, painted red and surmounted by a red vane marked with the figure 7 in white, indicating in feet the depth in which the buoy is moored. It shows a white light at night.

Compadres Shoal buoy is a cylindrical iron buoy, carrying a tripod, surmounted by a spherical cage with a vane, on which is painted the number 14 in black on a white ground, indicating in feet the depth in which the buoy is moored. This buoy is painted white.

Directions.—When bound for Santiago de Cuba from the eastward, give the shore a berth of about $1\frac{1}{2}$ or 2 miles to avoid the foul ground off the Morro, until Estrella Point comes open. When the latter bears N. 36° E. (N. 34° E. mag.), haul in upon this course, being careful not to bring it to the eastward of that bearing, and pass the Morro Point close aboard or at a distance of 50 yards, to avoid the ledge running off from the western point of entrance. Keep the eastern shore aboard until the Estrella is passed, then steer in mid-channel between the shore and Smith Cay, on the south end of which there is a small village where pilots reside.

Having rounded the beacon off Gorda Point the beacon buoy will be seen on Colorado Shoal, in the middle of the channel, which must be kept to port; Gorda Point Cliff south of it being clear of danger. Then steer along the eastern shore, which is steep-to, and pass to the southward and eastward of Ratones Cay, on which there is a magazine.

Having passed Ratones Cay steer about N. 13° E. (N. 11° E. mag.), passing westward of the beacon buoy on the Compadres, the outer of the two small rocks (the inner one is 2 feet above water). Then haul up for the city, and anchor according to the vessel's draft, the depth decreasing gradually toward the upper part of the harbor. A vessel will have a good berth in 4 fathoms water, about $\frac{1}{2}$ mile from the city, with Ratones Cay S. 39° W. (S. 37° W. mag.) and Blanca Battery, which is painted red, S. 54° E. (S. 56° E. mag.). In leaving, it will be advisable to drop down to the entrance with the sea breeze on the previous evening, to be in readiness for the land wind on the following morning. Strangers should take a pilot.

A sailing vessel may enter the port as far as the outer anchorage with the wind from ESE., but to proceed to the city she must have the wind as

far to the southward as SE. by E., in order to weather the Colorado Shoal. To leave the port, as she will have to haul up as far as SE. by E., between Smith Cay and Gaspar Point, the wind should be as far to the northward as NE. With very light winds vessels should not attempt to enter or leave the port under sail. In winter, when NE. winds prevail, some days may elapse when vessels can not enter under sail, but there is generally during the daytime a breeze from SE.

During the rainy season the current in the channel at the entrance is very strong.

Pilots are efficient, not necessary for a man-of-war, but compulsory for merchant vessels. The following are the day (between sunrise and sunset) rates: Night rates double; for change of anchorage half rates are charged: Vessels of 100 tons and under, \$9, and \$1.50 additional for each additional 100 tons up to vessels of 500 tons; vessels from 501 to 700 tons, \$16; 701 to 900 tons, \$18; 901 to 1,000 tons, \$20, and \$2 additional for each additional 1,000 tons.

NOTE.—When a vessel is coming out a red and yellow flag is shown from the flagstaff to the eastward of the lighthouse. An incoming vessel must wait until the outgoing one is clear of the Morro, as the channel is too narrow for passing.

The city is quite large and is the oldest in the island, and is built on the NE. side of the harbor.

An iron pier 580 feet long has been built on wooden piles on the northern side of La Cruz Point. Deepest draft of water, 30 feet. A railway connects the iron ore mines, 17 miles distant, with the pier, and vessels can load 3,000 tons a day. This pier is only adapted for loading ore. There are several other piers suitable for vessels of from 10 to 16 feet.

The place is healthy, but in summer yellow fever occurs. During the winter the temperature varies from 65° to 85°. The mornings and afternoons are pleasant. Liberty should not be given here.

The authorities to be visited are governor of the province and the captain of the port.

There is a battery of nine guns, and salutes are returned.

The United States is represented by a consul and vice-consul.

Supplies.—Provisions of all kinds can be obtained. Fresh meat, from 10 to 20 cents per pound. Pipes are laid into the city from a reservoir of excellent water, supplied from streams on the hills. Costs 50 cents per barrel if taken from hydrants; 80 cents to \$1, according to quantity, if delivered.

Coal, in large quantities, can be had from \$8 to \$9 per ton, brought off in lighters. Vessels of 12 feet can haul alongside the wharf northward of Cariviza to coal.

Dock.—There is reported to be docking facilities at Santiago for small craft. There is also a place for careening.

There are two good shops where ordinary repairs to steamers may be made.

Telegraph.—A telegraph cable connects Santiago de Cuba with Jamaica and the Windward Islands, and another laid along the south coast affords communication via Habana with the United States and Europe. A line also connects with all the principal ports on the island.

Communication.—The New York and Cuba steamship companies' steamers leave New York every two weeks for Cienfuegos, stopping going

and returning. Time from New York, 5 days. There is frequent communication with Habana and other Cuban ports; also with the different islands.

Dues.—There are no tonnage or light dues. Signal dues, \$4; health dues, \$4.25; interpreting fees, \$4.25; wharfage, \$5 per day; custom-house fees, \$10; bill of health, \$2.50; labor, \$2 per day; ballast, discharging, \$1 per ton; lighterage, 8 cents per load of 200 pounds.

Tides.—It is high water, full and change, at Santiago de Cuba at 8h. 30m.; the rise is 2 feet.

Winds.—Within the port squalls are frequent between May and October, bringing much rain and wind, especially if they come from the NE.; they appear to rise in a great measure from local circumstances, inasmuch as off the coast, and even in the channel they are less frequent. The land winds are constant during the night, weak from May until October, but fresh in the dry months and northerly winds; sometimes they begin to blow at 9 p. m., at other times they do not commence until early morning, yet they almost always last until a little before the sea breeze sets in between 9 and 10 a. m. Between the two winds there is an interval of calm.

Sailing vessels should avoid running into the calm near the Morro, especially if there be much sea outside. From May till October storms from the SE. take place all along the coast, when the weather is so thick and dirty as to completely obscure it; during which it is dangerous to endeavor to make the port, as it is then difficult to recognize, and the sea is so heavy at the entrance as occasionally to close it.

El Portillo, 24 miles east of Cape Cruz, is a harbor said to be accessible to vessels of large size. Good temporary anchorage will be found here for vessels of the heaviest draft. The locality may be known by three perpendicular white cliffs on the western side of the harbor, while the land on the eastern side is low and marshy. Both points of entrance are foul to a short distance, but the reefs which skirt them are steep-to, and the sea breaks upon them. The interior of the harbor is obstructed by sand banks, which are generally marked out by stakes.

Directions.—At a distance of 1 mile from the land, after bringing the entrance to bear N. 20° W. (N 23° W. mag.) vessels can stand in confidently, as there is no danger that does not show.

Shoal water extends a short distance from each point, but it can be readily seen from a ship's deck.

Vessels drawing 12 feet of water should anchor with the eastern point bearing S. 65° E. (S. 68° E. mag.) in about 5 fathoms of water. Vessels of less draft than 12 feet can proceed inside and find shelter from all winds, but the anchorage is confined. The outside anchorage would be uneasy and unsafe with winds from ESE. to south.

About 12 miles westward from Portillo there is said to be an excellent reef harbor, called Ensenada de Mora, for vessels of any size, with no dangers that are not apparent and easily avoided. It is at the foot of the Ojo del Toro Mountain, and, although no precise directions can be given for it, the knowledge of its existence might, in emergency, be useful.

GENERAL INDEX.

A general index has been added to these Notes, since such an index is necessary in a work partaking somewhat of the character of a directory. With the index it is hoped that besides their military value, the Notes will also gain in value as a directory of the Island of Cuba.

The abbreviations used in the index are given below with an example of their application:

I.—After each name is indicated whether it is a province, district, city, etc., thus:

Pr	Province.
J. D.	Judicial District.
T	Township.
c.	City.
t.	Town.
o. v.	Outlying villages.

II.—After each city, district, etc., is given the province in which it is situated, thus:

P. R.	Pinar del Rio Province.
H	Habana Province.
M	Matanzas Province.
S. C.	Santa Clara Province.
P. P.	Puerto Principe Province.
S. de C.	Santiago de Cuba Province.

III.—After each name a short indication as to the matter on the particular page indicated, thus:

r. r.	mentioned on this page as being on a certain railroad.
r.	mentioned on this page as being on a certain road.
desc.	on this page a description of the locality.
med.	on this page medical statistics on the locality.
t. con.	on this page table of contents relating to the locality.
t. dis.	on this page table of distances including the locality.

EXAMPLE.

Habana, Pr. t. con.	See this page for table of contents on Province of Habana.
Habana, J. D. H.	See this page for Judicial District of Habana in the Province of Habana.
Habana, T. H.	See this page for Township of Habana, Province of Habana.
Habana, c. H. desc. t. con.	See this page for table of contents of description of the city of Habana, Province of Habana.

- Habana, c. H. defenses, t. con... See this page for table of contents on the defenses of the city of Habana, Province of Habana.
- Habana, c. H. environs, t. con... See this page for table of contents on the environs of the city of Habana, Province of Habana.
- Habana, c. H. r r..... City of Habana, in Province of Habana, mentioned as on a certain railroad on this page.
- Habana, c. H. r..... City of Habana in Province of Habana mentioned as on a certain road on this page.
- Habana, c. H. med..... Medical statistics on the city of Habana in Province of Habana on this page.
- Habana, c. H. t. dis..... City of Habana in Province of Habana in a table of distances on this page.
- Habana, c. H. t. dis. r. r..... City of Habana, Province of Habana, in a railroad table of distances on this page.
- Habana, c. H. t. dis. r..... City of Habana, Province of Habana, in a table of distances of a road on this page.

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